ATTACHMENT RB-11

This is the attachment marked '**RB-11**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

Revitalising Acute Inpatient Services

Department of Human Services Response and Report of the Review of Adult Acute Inpatient Mental Health Services

Review of Adult Acute Inpatient Mental Health Services
Department of Human Services Response

Introduction

Victorian Government Policy has identified a need to move the mental health service system in a direction that has greater transparency to the broader community. In particular, the need to ensure the provision of accessible, high quality acute bed based mental health services has been identified.

A review of Adult Acute inpatient mental health services commenced in early 2000 and was completed in September 2000. It provides the basis for development of the Mental Health Policy and Plan.

The Review findings and recommendations offer an important information source for the Policy and Plan. This information together with other available data and recent consultations outlines issues requiring particular attention in the development of an improved mental health system. The Policy and Plan will identify a way forward, to strengthen the specialist system and broaden its responses to the changing and increasingly complex needs of people with a mental illness.

The Department of Human Services acknowledges the work of the Review team and in particular, recognises the significant and widespread consultation that informed the findings of the Review. In addition to structured interviews with all service providers, over 100 people attended a consultation forum and the Review received approximately 40 written submissions from a range of stakeholders.

The Department of Human Services strongly supports collaboration between acute inpatient and community mental health services, the private sector, primary care and support services to enable continuity of care and a more comprehensive and integrated service response.

The Department of Human Services is generally supportive of the recommendations outlined in the Review. Specific responses and comments in relation to each recommendation are included in Section 2 of this document.

Similarly, the Department of Human Services recognises the need to identify more appropriate funding models and identify resource allocation issues and improved workforce practice for acute inpatient units.

Recommendations in relation to staff training, education and professional development, increased activity in response to safety concerns and consumer and carer participation are welcomed.

The Department of Human Services further acknowledges that clearer definition of the purpose, admission process and appropriate clinical practice relating to acute inpatient care is required.

Defining the Role and Function of Adult Acute Inpatient Services

The Review articulates a need to encourage increased stakeholder debate and discussion about the role and operations of acute inpatient services.

A working group of the Ministerial Advisory Committee for Mental Health and Victorian Mental Health Consumer and Carer Ministerial Advisory Committee (VICCAG) has been established to develop in conjunction with the Mental Health Branch a mental health policy and plan. This will inform further development of:

- the purpose of acute inpatient care;
- the process for inpatient admissions; and
- the development of best practice model(s) of care for rural and metropolitan services.

Consumers and carers will be important participants in this activity.

The Office of the Chief Psychiatrist has been requested to develop practice guidelines in relation to:

- locked wards/doors on adult acute inpatient units; and
- illicit drug use on inpatient wards.

These are currently in preparation.

Improving Access to Mental Health Services

The Review found that the number of beds across the State appeared to be in line with other states but identified an inequitable distribution of acute inpatient beds across the state.

The Review correctly highlights the importance of equitable distribution of resources and area-self-sufficiency in the provision of mental health care as key factors in ensuring local access and continuity of care.

The Mental Health Branch will analyse the current weighted population formula utilised to determine the distribution of mental health resources across the State. Recommendations of the Duckett Review will also be incorporated in relation to aligning Mental Health Service boundaries to the broader general health services.

Efficiency

The Review identifies significant variations in the cost of delivering acute inpatient mental health services. Costing information is poor, as mental health services are not always separately accounted for by the Health Services Agencies. The Review further suggests that the capacity to benchmark between like services using the same assumptions is necessary to improve clinical practice.

The Review identifies the importance of developing a new funding model to provide incentives for the appropriate distribution of service resources and their efficient use. A new funding system for mental health will be developed over the next two years. Funding from the Commonwealth is supporting this project.

Enhancing Consumer and Carer Participation

The Review found that, although advances had been made in consumer and carer participation in mental health services over recent years, there remains significant capacity for further improvement. A range of recommendations are made with the aim of improving participation and consumer and carer involvement.

The Mental Health Branch will develop a proposal in consultation with the Victorian Consumer and Carer Advisory Group to further enhance consumer and carer participation in all mental health services, including statewide and specialist services.

The proposal will involve:

- enhanced support to consumer and carer representative organisations to participate in local and statewide initiatives;
- an identified structure and process for more local consumer participation in service planning and developments.

Appropriateness

The Office of the Chief Psychiatrist will continue to review service appropriateness.

The Mental Health Branch and Office of the Chief Psychiatrist will produce periodic performance information to promote continuous quality improvement.

Developing the Mental Health Service Workforce

The Review identified significant variation in work practices across services and articulates a range of issues for the mental health acute inpatient workforce relating to skills, knowledge, expertise and support.

A number of current initiatives being implemented will positively impact on issues identified within the Review. These will include:

- the implementation of a comprehensive education, training and professional development package; and
- the development of an occupational assault code of practice.

Improving the Effectiveness of Mental Health Service Interventions

The Review identifies limited systematic evaluation of the clinical effectiveness of adult acute inpatient mental health services.

The Mental Health Branch is in the process of implementing a project aimed at introducing routine client (adult) outcome measurement across the State. The overarching aims of the Victorian Outcome Measurement Project are to:

- ensure that the mental health sector undertakes continuous quality improvement;
- enable consumer health status to be monitored by consumers and clinicians;
- enable comparison of services across the State; and

- provide the basis for the ongoing development of health status and outcome measurement across all mental health clients (children, aged and forensic).

Conclusion

Since 2000/01 an additional $17.3M has been allocated to mental health to implement a number of Government initiatives for improved service delivery to people with a mental illness. These initiatives include: Primary Mental Health and Early Intervention teams; the Statewide Dual Diagnosis Program; increased availability of inpatient beds, additional mental health workers for crisis prevention, Mobile Support and Treatment Teams, Continuing Care Units, Psychiatric Disability Support Services and Koori services and centres of excellence for eating disorders and depression and related disorders.

The Mental Health Policy and Plan will be completed by mid 2002. Currently focus group consultations are underway to assist Government with the identification of future directions and priorities. The Policy and Plan will articulate strategies for resource distribution workforce development, demand management and research and evaluation as well a number of service improvement and partnership initiatives.

Detailed Response to Review Recommendations

Recommendation	Response	Required Outcomes
Rec 1. Mental Health Branch develops plans to identify and where appropriate address the inequitable geographic distribution of acute adult inpatient beds.	Agreed	Mental Health Branch to review, and if necessary revise current weighted population formula. Resource distribution plan to be developed. Plan to ensure (overtime) implementation of equitable distribution of resources across the State.
Rec 2. Mental Health Branch works with service providers to understand better the relationships between service structure, clinical practice and area self-sufficiency for individual area mental health services.	Agreed	A Working Group of the Ministerial Advisory Committees (MAC and VICCAG) for Mental Health has been established. The Group will address a range of issues identified by the Review in relation to the structure, function and clinical practice relating to acute inpatient services as part of the development of a Mental Health policy and plan
Rec 3. Mental Health Branch, as an interim approach until equitable distribution of inpatient resources is addressed, supports the establishment of a system to manage out-of-area admissions that: 3.1 takes centralised responsibility for monitoring and allocating adult acute inpatient mental health beds across Victoria. 3.2 enables better communication of inpatient bed availability. 3.3 establishes a functional system of financial incentives for area self-sufficiency.	Not Agreed	The MHB in consultation with the Office of the Chief Psychiatrist and providers to consider options to improve the out of area admission process.
Rec 4. To emphasise the importance of area self-sufficiency in acute psychiatric inpatient services, Boards of Metropolitan Health Services and rural hospitals periodically report "out-of-area" activity.	Qualified Agreement	Mental Health Branch to define indicators. Development of Key Performance Indicators will be considered as part of the Information Development Plan funded by the Commonwealth government.

Recommendation	**Response**	**Required Outcomes**
Rec 5. Mental Health Branch publishes service data on inpatient beds self-sufficiency in the public domain.	Qualified Agreement	See response to Rec. 4 Analysis of Mental Health Service Performance to be undertaken on a regular basis.
Rec 6. Mental Health Branch assists area mental health services to develop options that increase the current permanent workforce and reduce use of casual staff and overtime payments.	Agreed	Mental Health Branch to continue to work with the workforce policy unit, Policy Planning and Development DHS to improve recruitment and provide appropriate education and training to the Mental Health workforce. Mental Health Branch to facilitate implementation of the Psychiatric Services Enterprise Bargain agreement relating to a comprehensive education, training and professional development and support package.
Rec 7. Mental Health Branch supports service evaluation research that leads to greater understanding of the relationship between staffing structures, career paths, work environments and clinical practice.	Agreed	Mental Health Branch to consult with the Workforce Policy Unit to identify opportunities for relevant research.
Rec 8. Mental Health Branch reviews the current funding model for acute inpatient units. Mental Health Branch identifies future resource requirements to address price / cost variations.	Agreed	Mental Health Branch is currently undertaking a cost analysis of inpatient mental health services. Note recommendation 10.
Rec 9. Mental Health Branch addresses the service and resource implications of the recommendations of the *Ministerial Review of Health Care Networks.*	Agreed	Funding implications relate primarily to the realignment of boundaries and subsequent reallocation of resources. Refer Recommendation 1

Recommendation	Response	Required Outcomes
Rec 10. Mental Health Branch develops and implements over the next 12 months a new purchasing policy in relation to adult acute inpatient mental health services that: 10.1 achieves greater alignment between activity and financial accountability. 10.2 reduces micro-management of local services. 10.3 provides appropriate incentives for greater flexibility in service configuration to meet local needs.	Qualified Agreement	Work is currently underway to develop a new funding framework for mental health services as part of the Information Development Plan. Funding model developed by June 2003.
Rec 11. Mental Health Branch encourages stakeholder debate and discussion to establish a more definitive view of the purpose of acute psychiatric admission.	Agreed	Refer Recommendation 2 response.
Rec 12. Mental Health Branch develops policy and procedure guidelines related to inpatient admission that reflects this view.	Agreed	Refer Recommendation 2 response.
Rec 13. Mental Health Branch works with services to assist improved sharing of innovative ideas about inpatient services.	Agreed	Refer Recommendation 2 response.
Rec 14. Mental Health Branch clarifies policy with regard to locked doors on adult acute inpatient units.	Agreed	Office of the Chief Psychiatrist has commenced the development of guidelines in relation to High Dependency Units.
Rec 15. Mental Health Branch ensures that the Office of the Chief Psychiatrist reviews relevant aspects of service appropriateness.	Agreed	Refer Recommendation 2 response.

Recommendation	Response	Required Outcomes
Rec 16. The Mental Health Branch and Mental Health Service Providers develop strategies to improve service relationships with other health/welfare services to achieve a more comprehensive and integrated response for mental health consumers.	Agreed	Refer Recommendation 2 response. The newly implemented Primary Mental Health Teams will ensure improved integration with primary care and improved access to services for those with high prevalence illnesses such as anxiety and depression.
Rec 17. Mental Health Branch requires, within service agreements, that area mental health services demonstrate progress in outcome measurement to achieve: 17.1 comparative benchmarking with peer services 17.2 processes to address unjustifiable variation in outcomes. 17.3 better understanding of the purpose of, demand for and impact of their programs.	Agreed	The Mental Health Branch is currently developing routine outcome measurement to be implemented in all adult mental health services. The Mental Health Branch will assist services implement the program, monitor the process and review its appropriateness over time.
Rec 18. Mental Health Branch develops a renewed emphasis on safety issues in psychiatric inpatient units at a central level and all area mental health services review their local policies and procedures in this area.	Agreed	Occupational health and safety issues are being considered as part of the enterprise bargaining process.
Rec 19. Mental Health Branch develops policies and guidelines on the identification, assessment and appropriate response to illicit drug use in acute adult inpatient units.	Agreed	Office of the Chief Psychiatrist has prepared practice guidelines.
Rec 20. Mental Health Branch ensures a staff training and development program is provided across all mental health services that ensures a consistent approach to illicit drug use in acute adult inpatient units.	Agreed	Mental Health Branch has implemented training and development through the Statewide Dual Diagnosis Initiative.

Recommendation	**Response**	**Required Outcomes**
Rec 21. Mental Health Branch encourages initiatives that increase the use of the expertise of relevant statewide and specialist services in acute adult inpatient units.	Qualified	Refer Recommendation 2 response. Recommendation also addressed in the Review of Specialist and Statewide Mental Health Services (2000).
Rec 22. Mental Health Branch ensures that all proposals to redesign, renovate or build acute psychiatric inpatient units satisfy contemporary standards for facility design.	Agreed	Ongoing
Rec 23. Mental Health Branch requires that appropriate input from consumers and carers is obtained to both policy review and education and training in safety.	Agreed	Mental Health Branch in consultation with VICCAG develop strategies to ensure adequate input of consumers and carers into the planning, delivery, monitoring and management of mental health services.
Rec 24. Mental Health Branch and services implement the recommendations of the *Evaluation of Consumer Participation in Victoria's Public Mental Health Services: Final Report* .	Qualified Agreement	Mental Health Branch in consultation with VICCAG to implement, over time, the recommendations of the Review.

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1 EXECUTIVE SUMMARY

1.1 Background

Government Policy has identified a need to move the mental health service system in a direction that has greater transparency to the broader community in terms of access and utilisation decisions. There has also been a commitment made to review the adequacy of funding for bed based services across both adult mental health services and specialist and statewide mental health services. For these reasons on 19 January 2000 the Minister for Health, the Honourable John Thwaites MP, announced a review of statewide and specialist mental health services and acute adult inpatient mental health services across Victoria. This document reports the findings of the Review of Adult Acute Inpatient Mental Health Services.

The Terms of Reference for the Review of Adult Acute Inpatient Mental Health Services were:

1. To gather and analyse quantitative and qualitative data about existing adult acute inpatient mental health service delivery in Victoria.
2. To identify relevant service provision issues arising from the data collection.
3. To identify options and make recommendations about future Service framework(s) for adult acute inpatient mental health services.
4. To review existing funding mechanisms and issues and to develop recommendations regarding appropriate funding models to support the identified preferred service framework(s).

The mandate of the Review team did not include review of individual acute inpatient services, rather it was to provide a broad picture of key issues for services as a whole. The Review team noted the level of commitment and leadership shown by senior staff; the expertise in management of acute disorders; examples of creativity and innovation within individual services; and the care and dedication of staff working in demanding circumstances.

The approach of the Review followed a framework outlined in *Quality and Outcomes Indicators for Acute Healthcare Services* (Boyce et al, 1997), which defined relevant domains of quality in health care as access, efficiency, appropriateness, effectiveness, safety, and consumer and carer participation.

Using this framework as a guide the Review consulted with a wide range of individual stakeholders and special interest groups and sought individual submissions by public advertisement. Routinely collected process, outcome and financial data was also examined. While no single data source provides a complete picture of services, they are consistent. The Review team are confident that the Review obtained an accurate overall view of the issues confronting acute adult inpatient mental health services in Victoria.

1.2 Summary of Key Issues and Recommendations

1.2.1 Access

Access to acute inpatient mental health services emerged as the single most emphasised issue among stakeholders. The Review did not find evidence that the overall number of acute inpatient beds is inadequate however did identify significant variation between adult acute inpatient services on a range of data relating to access to beds. The Review therefore makes recommendations aimed at ensuring equitable distribution of beds and improving understanding of demand pressure drivers in the delivery of adult acute inpatient services. The issue of local area self-sufficiency in the provision of inpatient beds to the local catchment population emerged as particularly significant. The importance of self-sufficiency relates to ensuring continuity of care for consumers across community and inpatient settings. The Review found concern among some services about the current capacity for self-sufficiency and little support for the current system of managing out-of-area bed admissions. A number of recommendations therefore relate to addressing issues of self-sufficiency. It is recommended that:

Rec 1. Mental Health Branch develops plans to identify and where appropriate, address the inequitable geographic distribution of acute adult inpatient beds.

Rec 2. Mental Health Branch works with service providers to understand better the relationships between service structure, clinical practice and area self-sufficiency for individual area mental health services.

Rec 3. Mental Health Branch, as an interim approach supports the establishment of a system to manage out-of-area admissions that:
   a. takes centralised responsibility for monitoring and allocating adult acute inpatient mental health beds across Victoria.
   b. enables better communication of inpatient bed availability.
   c. establishes a functional system of financial incentives for area self-sufficiency.

Rec 4. To emphasise the importance of area self-sufficiency in acute psychiatric inpatient services, Boards of Metropolitan Health Services and rural hospitals periodically report "out-of-area" activity.

Rec 5. Mental Health Branch publishes service data on inpatient beds self-sufficiency in the public domain.

1.2.2 Efficiency

The three major issues related to service efficiency that were raised in the process of the Review were length of stay, levels of staffing and distribution of financial resources. In addition, a need to review current financing mechanisms and funding models was identified.

It is recommended that:

Rec 1. Mental Health Branch assists area mental health services to develop options that increase the current permanent workforce and reduce use of casual staff and overtime payments.

Rec 2. Mental Health Branch supports service evaluation research that leads to greater understanding of the relationship between staffing structures, career paths, work environments and clinical practice.

Rec 3. Mental Health Branch reviews the current funding model for acute inpatient units and identifies resource requirements to address price/cost variations.

Rec 4. Mental Health Branch addresses the service distribution and resource implications of the recommendations of the *Ministerial Review of Health Care Networks.*

Rec 5. Mental Health Branch develops and implements over the next 12 months a new purchasing policy in relation to adult acute inpatient mental health services that:
   a. achieves greater alignment between activity and financial accountability.
   b. reduces micro-management of local services.
   c. provides appropriate incentives for greater flexibility in service configuration to meet local needs.

1.2.3 Appropriateness

The Review found little consistency in stakeholders' views of the purpose of an acute inpatient admission. Without this reference point it is difficult to make judgements regarding the appropriateness of care provided. The Review identified significant variations in practice between services on a range of indicators that can be viewed as relating to service appropriateness. It is recommended that:

Rec 1. Mental Health Branch encourages stakeholder debate and discussion to establish a more definitive view of the purpose of acute psychiatric admission.

Rec 2. Mental Health Branch develops policy and procedure guidelines related to inpatient admission that reflects this view.

Rec 3. Mental Health Branch works with services to assist improved sharing of innovative ideas about inpatient services.

Rec 4. Mental Health Branch clarifies policy with regard to locked doors on adult acute inpatient units.

Rec 5. Mental Health Branch ensures that the Office of the Chief Psychiatrist reviews relevant aspects of service appropriateness.

Rec 6. The Mental Health Branch and Mental Health Service Providers develop strategies with other services to achieve a more comprehensive and integrated health outcome for consumers.

1.2.4 Effectiveness

The Review identified few examples of systematic evaluation of the clinical effectiveness of adult acute inpatient mental health services and makes recommendations to increase routine collection of this information. Considerable variation was apparent on those measures considered to be proxies for effectiveness of inpatient service.

It is recommended that:

Rec 1. Mental Health Branch requires, within service agreements, that area mental health services demonstrate progress in outcome measurement to achieve:
   a. comparative benchmarking with peer services.
   b. processes to address unjustifiable variation in outcomes.
   c. better understanding of the purpose of, demand for and impact of their programs.

1.2.5 Safety

Many stakeholders expressed concern about safety on acute inpatient units. In particular, issues around the prevalence of inappropriate drug and alcohol use were raised. The Review makes a number of recommendations relating to the development of appropriate guidelines and the provision of training to address concerns regarding safety in inpatient units.
It is recommended that:

Rec 1. Mental Health Branch develops a renewed emphasis on safety issues in psychiatric inpatient units at a central level and all area mental health services review their local policies and procedures in this area.

Rec 2. Mental Health Branch develops policies and guidelines on the identification, assessment and appropriate response to illicit drug use in acute adult inpatient units.

Rec 3. Mental Health Branch ensures a staff training and development program is provided across all mental health services that ensures a consistent approach to illicit drug use in acute adult inpatient units.

Rec 4. Mental Health Branch encourages initiatives that increase the use of the expertise of relevant statewide and specialist services in acute adult inpatient units.

Rec 5. Mental Health Branch ensures that all proposals to redesign, renovate or build acute psychiatric inpatient units satisfy contemporary standards for facility design.

Rec 6. Mental Health Branch requires that appropriate input from consumers and carers is obtained to both policy review and education and training in safety.

1.2.6 Consumer and Carer Participation

Although the Review found evidence that consumer and carer participation in mental health services has improved over recent years, considerable capacity for further improvement was identified. The Review recommends enhancement of existing programs and provision of additional support for consumer and carer involvement, and the development of further initiatives for the support of carers.

It is recommended that:

Rec 1. Mental Health Branch and services implement the recommendations of the *Evaluation of Consumer Participation in Victoria's Public Mental Health Services: Final Report*.

Rec 2. Mental Health Branch and services enhance the involvement of consumers and carers in all aspects of service delivery by:
   a. increasing the capacity for consumer and carer input to services.
   b. including consumers and carers in organisational management of services.

Rec 3. Mental Health Branch and services address the issues of inadequate support for and high stress levels of consumer consultants, particularly in rural areas.

Rec 4. Mental Health Branch and services identify opportunities to improve support for carers and develop initiatives to implement them.

2 INTRODUCTION

2.1 Background and Context

The need for a Review of Acute Inpatient Mental Health Services has arisen for a number of reasons. Consideration of these services last occurred in 1994 when the components of the current Victorian mental health system were established (Mental Health Branch, 1994). Although that process initiated important changes in the management, funding and delivery of inpatient services their impact has not been evaluated.

A number of concerns have been raised by consumers and carers about access to inpatient services and models of inpatient care. Services themselves have raised concerns about funding and their ability to provide the inpatient services required locally from within their current capacity.

These local developments have occurred alongside two relevant, though more general, reports. At the national level the *Second National Mental Health Plan* (AHMAC National Mental Health Working Group, 1996) recommendations about service delivery partnerships and service quality and effectiveness have significant potential impact on inpatient psychiatric beds. At the state level recommendations of the *Ministerial Review of Health Care Networks* (Duckett et al, 2000) about the structure, funding and accountability of health services will also influence acute inpatient treatment.

2.2 Terms of Reference

The Terms of Reference for the Review of Adult Acute Inpatient Mental Health Services were:

1. To gather and analyse quantitative and qualitative data about existing adult acute inpatient mental health service delivery in Victoria.
2. To identify relevant service provision issues arising from the data collection.
3. To identify options and make recommendations about future Service framework(s) for adult acute inpatient mental health services.
4. To review existing funding mechanisms and issues and to develop recommendations regarding appropriate funding models to support the identified preferred service framework(s).

2.3 Method

The mandate of the Review team did not include review of individual acute inpatient services, rather it was to provide a broad picture of key issues for services as a whole. The Review team noted the level of commitment and leadership shown by senior staff; the expertise in management of acute disorders; examples of creativity and innovation within individual services; and the care and dedication of staff working in demanding circumstances.

The approach of the Review followed a framework outlined in *Quality and Outcomes Indicators for Acute Healthcare Services* (Boyce et al, 1997), which defined relevant domains of quality in health care as access, efficiency, appropriateness, effectiveness, safety, and consumer and carer participation (see *Appendix 4 – Glossary of Terms*).

Using this framework as a guide the Review consulted with a wide range of individual stakeholders and special interest groups and sought individual submissions by public advertisement (see *Appendix — List of Participants*). We also examined routinely collected process, outcome and financial data from a number of different perspectives including expenditure data supplied by individual services.

The data were analysed for general trends and were not used to draw detailed conclusions about individual services.

The main method of analysis used in the Review was standardisation, a technique that allows direct comparison of data between populations by compensating for differences in their demographics and risk factors. For example, levels of funding for mental health services in Victoria are determined by a standardised, population-based, formula that produces a "level playing field" by compensating for catchment area differences in age, sex, marital status, levels of socioeconomic deprivation and other factors such as rurality, NESB population, and access to private psychiatry.

The Review standardised outcome data across service catchment areas by controlling for their differences in age, sex, marital status and levels of socioeconomic deprivation alone. These factors are the main predictors of utilisation of mental health services (see below, *Gaining access to acute inpatient services — research estimates of need*). By controlling for them, the analyses in the Review highlight differences in outcomes between catchment areas that are attributable to differences in service delivery and clinical practice, while limiting the impact of differences in outcomes attributable to differences in demand.

Since a similar, though not identical, standardisation process underlies the population-based funding formula another way of interpreting these analyses is that they approximate comparisons of outcomes between services that control for differences in funding.

A full account of the individual analyses is provided in the *Appendix — Methodology* section.

While no single data source provides a complete picture of services they are consistent. We are confident that the Review obtained an accurate overall view of the issues confronting acute adult inpatient mental health services in Victoria.

3 ACCESS

3.1 Introduction

Access to acute inpatient psychiatric services was the single most emphasised issue and aroused strong views. Many statements were made about an overall inadequacy of acute bed numbers.

To establish a context for this debate we compared National Mental Health Report data for Australia, consulted health departments in other states and examined past reports from Victoria. We also searched the research literature for material relevant to the requirement for psychiatric inpatient beds.

3.2 Current Estimates of Bed-use

Finding precisely comparable data between countries, states in Australia and across time is difficult. In the following discussion the unreferenced figures are estimates drawn from a number of sources, provided for indicative purposes. This report provides comparisons of these indicators across Victorian services in later sections.

Victoria provides 19.3 adult acute inpatient beds/100,000 population aged between 16-65 years, very similar to the national average. The occupancy of acute adult inpatient beds in Victoria is 87%, while the national average is 83%. By comparison, international research describes average occupancy rates of around 100% (Hollander, 1994; Lelliot et al, 1995; Fulop et al, 1996; King's Fund, 1997; Kelly, 1998; MacDonald et al, 1999). In a nationally representative one-day survey in 1996 of acute psychiatric inpatient facilities in the United Kingdom, (Ford et al, 1998), the average occupancy of 263 wards visited was 99%. In all these analyses occupancy rates of over 100% can occur because patients on leave or temporary transfer are included in inpatient figures.

Comparison of current data about metropolitan services with data from 1989-90 (Acute Services Working Party, 1991) is interesting.

Table 1: Service utilisation data for acute psychiatric services in metropolitan Melbourne, 1989/90 and 1998/99.

Parameter	1989/90	1998/99
Total metropolitan adult acute inpatient beds	447	372
Adult acute inpatient beds/100,000 adult population	21	19.3
Total number of admissions to metropolitan acute beds	5,733	9,548
Length of stay (days)	25	12.2
Readmission rate	32.4%	38.0%

The data indicate that major changes in service utilisation have occurred, notably increased throughput and reduced lengths of stay. In contrast, per capita beds and readmission rates remain relatively unchanged.

Access to acute inpatient beds was a concern in 1991 and remains so. Table 2 illustrates comparative PRISM data of reported available beds each year since 1995.

Table 2: Average available vacant beds reported to PRISM daily, statewide and for metropolitan facilities alone, by financial year since 1995

Year	*Statewide*	*Metropolitan facilities*
1995/96	91	56
1996/97	90	61
1997/98	71	46
1998/99	60	37
1999/2000	62	39

Whilst significant numbers of beds are still reported as available, there are fewer vacant beds available now than in 1995, the largest change occurring in 1997-98.

3.3 Research Estimates of Need

Research distinguishes between "need", "demand" and "utilisation" with regard to health services. Need is the absolute requirement for service delivery, which reflects a relationship between the prevalence of disorder and the ability of the parts of a health service to treat it. Demand is the translation of need into requests for service provision. Utilisation refers to how the components of service delivery are used. This is easier to measure but it may not necessarily reflect underlying demand. In mental health, these factors may not be well understood.

There are three recognised approaches to measuring population health requirements for mental health services. These are epidemiological methods that investigate need; comparative methods that investigate utilisation; and consultative methods that rely on a synthesis of the views of stakeholders (Commonwealth Department of Health and Aged Care, 1999).

Epidemiologists in the United States have demonstrated the usefulness of population surveys for mental health service planning (Manderscheid et al, 1993; Rupp et al, 1998) but in Australia research is relatively recent.

Data from the Australian *National Survey of Mental Health and Well Being* (Whiteford, 2000) hold promise but will require more study before they inform future service provision. The "low prevalence" part of the *Survey* (Jablensky et al, 1999) analysed service use for people living with psychotic illness in urban centres. Over half the respondents had been admitted to an inpatient unit during the previous 12 months. This high rate is partly attributable to identification of many of the sample through contact with mental health services. Over the same period 25.6% of the sample experienced a need for a mental health service that was not met. Unavailability of the service was the stated reason for unmet need in 15.6% of the total, but the survey does not state how often this unmet need was for acute inpatient services.

The second method that investigates utilisation, the comparative approach, has received attention internationally (Rosenheck & Astrachan, 1990; Kydd et al, 1991; Hendryx & Rohland, 1994; Kelly & Jones, 1995; Lesage et al, 1996) but is particularly developed in the United Kingdom, through work pioneered by Wing (1990) and Jarman and Hirsch (1992) and continued by the Research Unit of the Royal College of Psychiatrists (Wing, 1994; Wing & Lelliott, 1994).

The conclusions from this research are similar. Demographic factors such as age, gender, marital status and socio-economic deprivation predict the utilisation of inpatient mental health services better than any other indicators (Jarman & Hirsch, 1992; Kelly & Jones, 1995; Lesage et al, 1996). Researchers have refined these predictive models (Smith et al, 1996; Glover et al, 1998; Koppel & McGuffin, 1999) and they underpin much of the rationale for mental health resourcing in the United Kingdom (Department of Health, 1999).

However, comparative modelling is not the whole answer. For example, in the United Kingdom the relationship between population demographics and mental health service needs is not linear (Glover et al, 1999; Croudace et al, 2000). Application of linear models may underfund high and low need areas and overfund median need areas. Individual patient characteristics may also be important. A relatively small number of heavy service users accounts for a high proportion of the costs of mental health care. A review by Kent et al (1995) suggests that 10-30% of patients utilise 50-80% of the available service resources. Poor treatment adherence and comorbid alcohol and drug misuse were factors associated with disproportionately high readmission rates to an inner city psychiatric service in New South Wales (Hunt, personal communication).

Shepherd and colleagues (1997) surveyed 2236 inpatients to examine parameters related to bed occupancy in the United Kingdom. While there was an association between socio-economic deprivation and bed occupancy, both the number of available inpatient beds and the availability of alternative residential options also exerted a major influence on inpatient bed utilisation.

The third approach to needs assessment, based on stakeholder consultation, is poorly developed. The most notable example, the Oregon Health Plan, has had mixed results when applied to mental health services (Penner and McFarland, 2000).

In conclusion, the research literature provides considerable, but incomplete, information about the need for adult acute inpatient services in mental health. While demographic factors account for much of the variation in need this is not the whole story. Looking at inpatient facilities in isolation overlooks important issues such as the disproportionate impact of high service users, variation in the availability of alternatives to hospitalisation and supported accommodation on discharge.

3.4 Victorian Stakeholder View about Access Availability and Need

Service providers emphasised differences between areas in terms of their self-sufficiency in inpatient beds. Other stakeholders, including consumers and carers, general practitioners and psychiatric disability support services, reported that obtaining an adult acute inpatient bed had become more difficult in recent years.

From the range of views presented, the Review identified two categories of issues regarding access to inpatient beds. First, there was discussion of whether inpatient units admitted the numbers and kinds of people they should admit. Second, there was a set of issues that related to geographical accessibility, which are technically called "area self-sufficiency".

3.5 Role of an Inpatient Admission

There was no consensus about the purpose of an inpatient admission. Views ranged from describing admission as a last resort when community-based alternatives fail, through to identification of specific objectives for an admission. Consumers and carers, and referring agencies, commented that this difference in prevailing views about the purpose of admission varied between services over time and in response to peaks and troughs of demand.

Consumer and carers themselves expressed a range of views about the purpose of inpatient care, from short-term crisis intervention and addressing safety issues to respite, or "asylum".

3.6 Severity and Acuity Threshold for Admission

Generally, service providers expressed the view that patients who require admission generally receive it. Consumers and carers describe the threshold for admission as too high. This was particularly the case for carers. Consumer and carer informants reported advising people seeking admission to exaggerate their symptoms, for example, to threaten suicide or violence.

It was reported that access to inpatient facilities appeared to be easier if a person was already known to mental health services. While this might reflect more severely ill people being in continuous care, it might also act as a disincentive to achieving early intervention for new episodes of illness.

3.7 Rural Access Issues

Rural stakeholders described particular access problems. These included geographical distances of services from patients, the lack of alternatives to hospitalisation in rural areas and limited access to both private psychiatric services and statewide and specialist services.

Particular local issues were also raised including:

- the impact on resources of the flow of patients from New South Wales into Victorian inpatient services that adjoin the Murray River, and
- the practice of admitting patients with mental health problems into general medical beds in smaller country hospitals.

3.8 Data

The following charts derived from PRISM data for 1998/99, standardised to control for the effects of differences in age, sex, marital status and social deprivation across catchment areas.

Analysing the data in this way enables comparison to be made between service utilisation independent of socio-demographic differences between catchment areas (see *Appendix 3 — Methodology*).

Chart 1[*] shows the number of adult acute inpatient admissions per 100,000 of the population aged between 18-65 years in the catchment area of each mental health service, standardised as previously described. It demonstrates a threefold variation in the likelihood of being admitted between area mental health services. The standardisation eliminates most of the variation attributable to underlying population morbidity. Accordingly the remaining variation is most likely due to differences in service delivery models and clinical practices.

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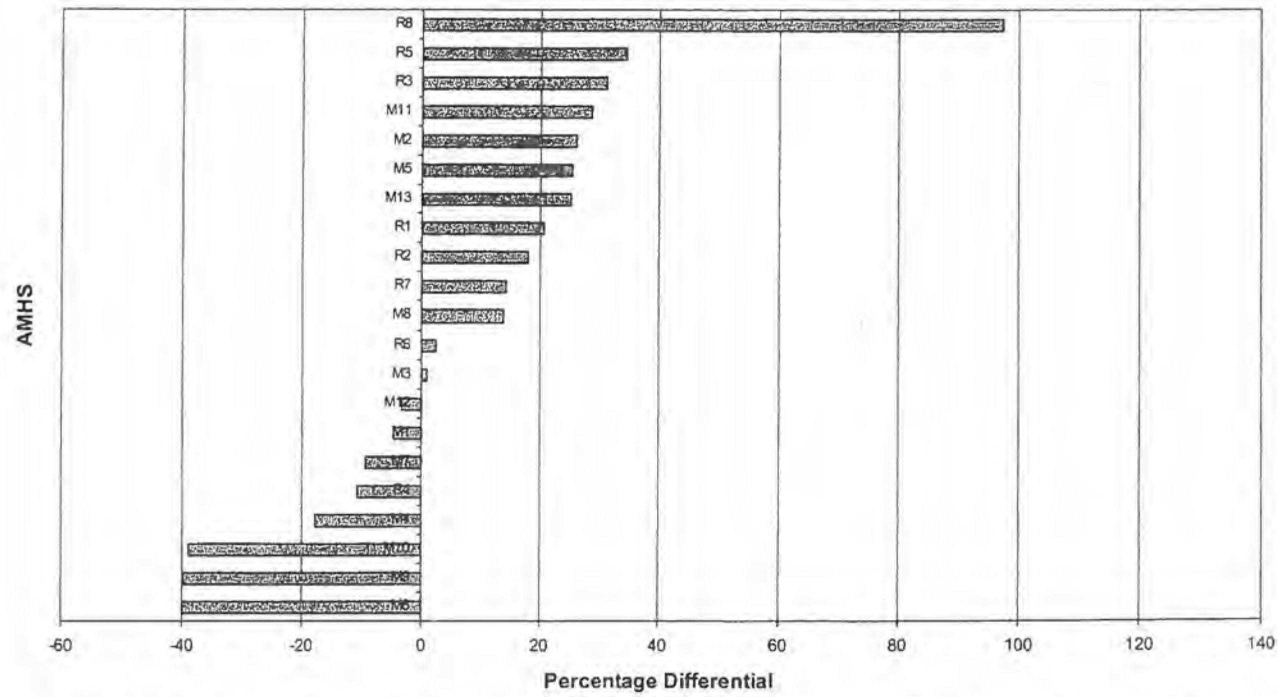
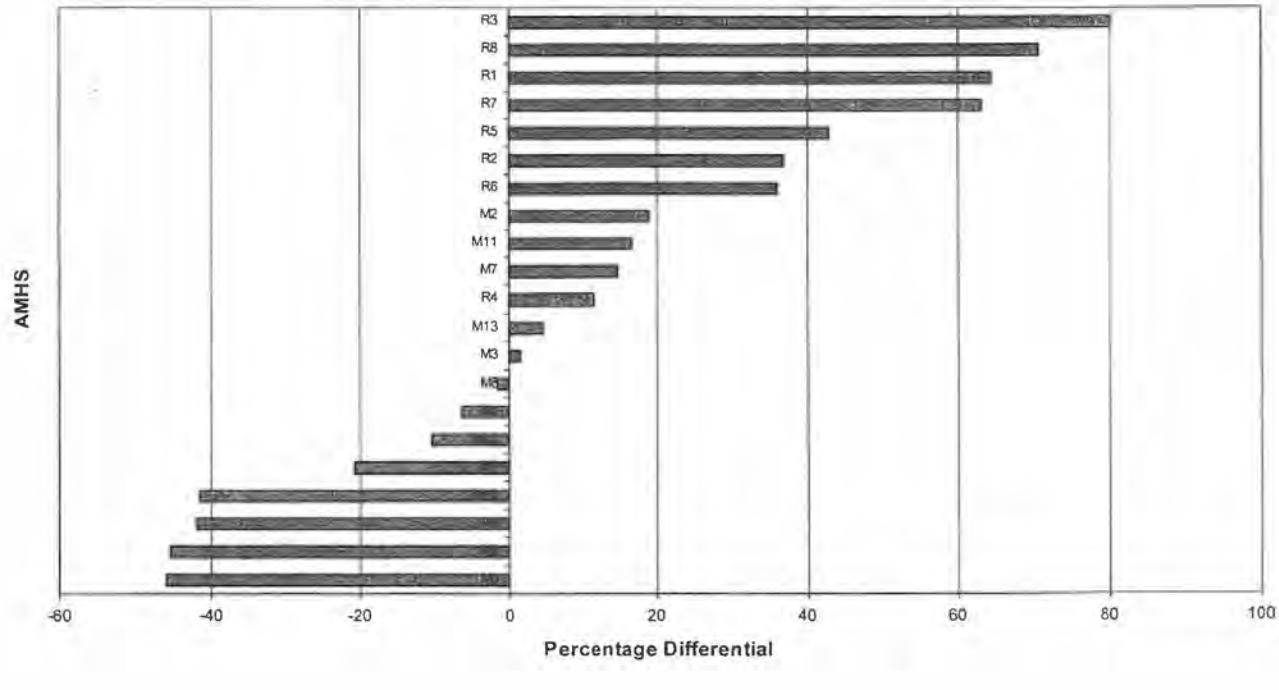
[*] Note: Adult Acute Inpatient Mental Health Services are represented in the charts presented in this report by the codes R1-8 for Rural Services and M1-13 for Metropolitan Services. These codes have been randomly assigned and are consistent throughout the report. The 0 percentage differential axis represents the statewide average in each chart.

Chart 1: ***Standardised Acute Inpatient Care for Adults by AMHS***



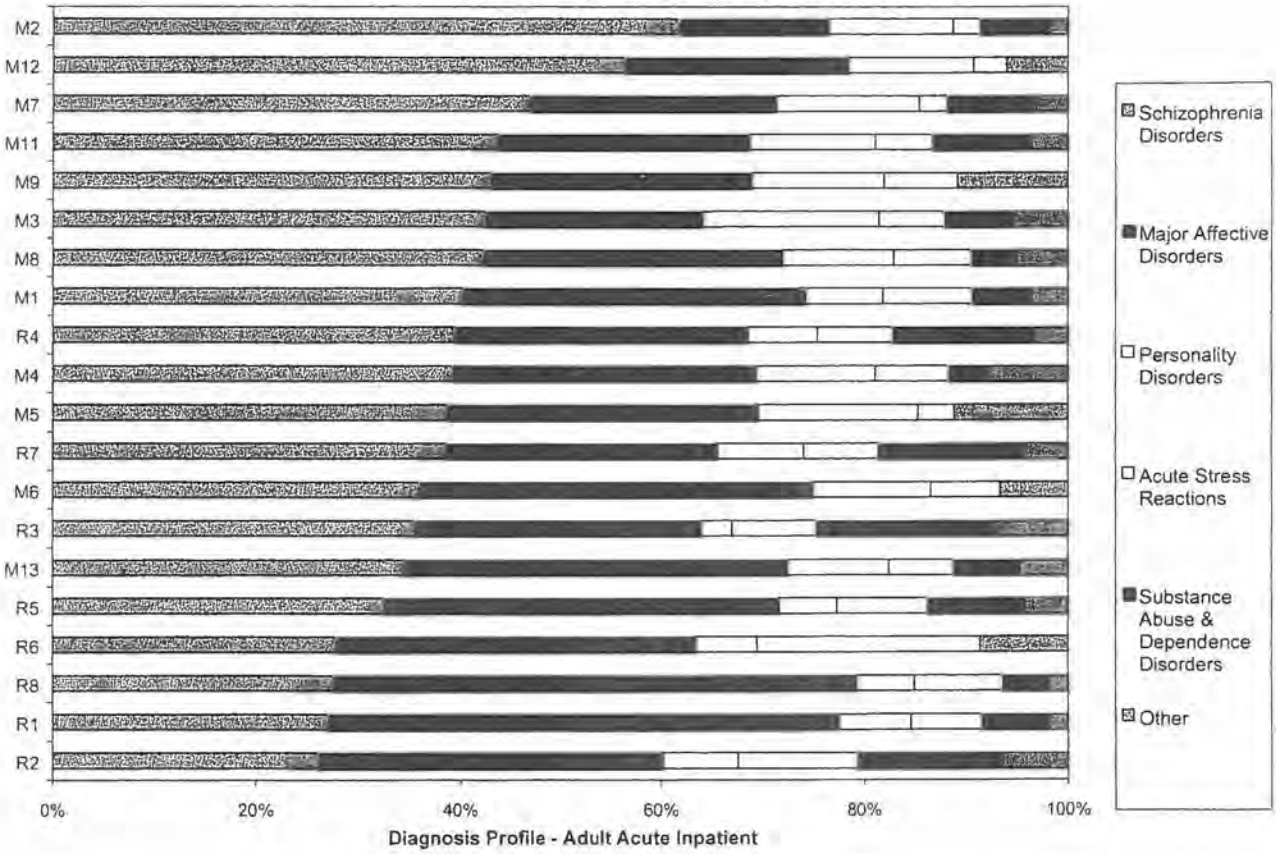
In a similar fashion, Chart 2 shows the standardised number of community mental health episodes per 100,000 of the adult population. It also demonstrates a threefold variation in access to community mental health care – again the explanation is most likely attributable to differences in service delivery models and clinical practices. Interestingly, in both metropolitan and rural settings, those services that have high utilisation of inpatient services tend to have high utilisation of community based care.

Chart 2: ***Standardised Community Care for Adults by AMHS***



In general, rural services demonstrate higher utilisation rates than metropolitan services, which at first glance does not support anecdotal impressions of poor access in rural areas. However, what must be taken into consideration with respect to the rural sector is that alternative private and public health and welfare services are often not available. This is supported by the data in Chart 3. They show that, in general, rural mental health services have a lower percentage of discharge diagnoses of schizophrenia and a higher percentage of discharge diagnoses of acute stress, substance abuse and dependence and other disorders than metropolitan services, possibly due to limited treatment alternatives.

Chart 3: ***PRISM Discharge Diagnosis by AMHS 1998/99***



3.9 Area Self-Sufficiency

In this context area self-sufficiency means that local catchment population demand for inpatient beds will be met by local services. For mental health services the importance of area self-sufficiency lies in ensuring continuity of care for consumers across community and inpatient mental health services.

Self-sufficiency in area acute inpatient beds was a controversial topic that promoted heated discussions during the Review. There was little support for the current system of bed allocation for out-of-area admissions.

Services described the inherent organisational inefficiencies involved in finding beds when required and the negative impact of discontinuity of care. The stress created for both patients and staff in this situation was clearly described.

Services who accept significant numbers of out-of-area patients described feeling disadvantaged by other services' "inadequacies" and by the organisational inefficiencies inherent in having larger numbers of shorter admissions. The value of self-sufficiency to clinical care was widely accepted but there appear to be major differences between services in adapting their clinical policies and practices to address these issues.

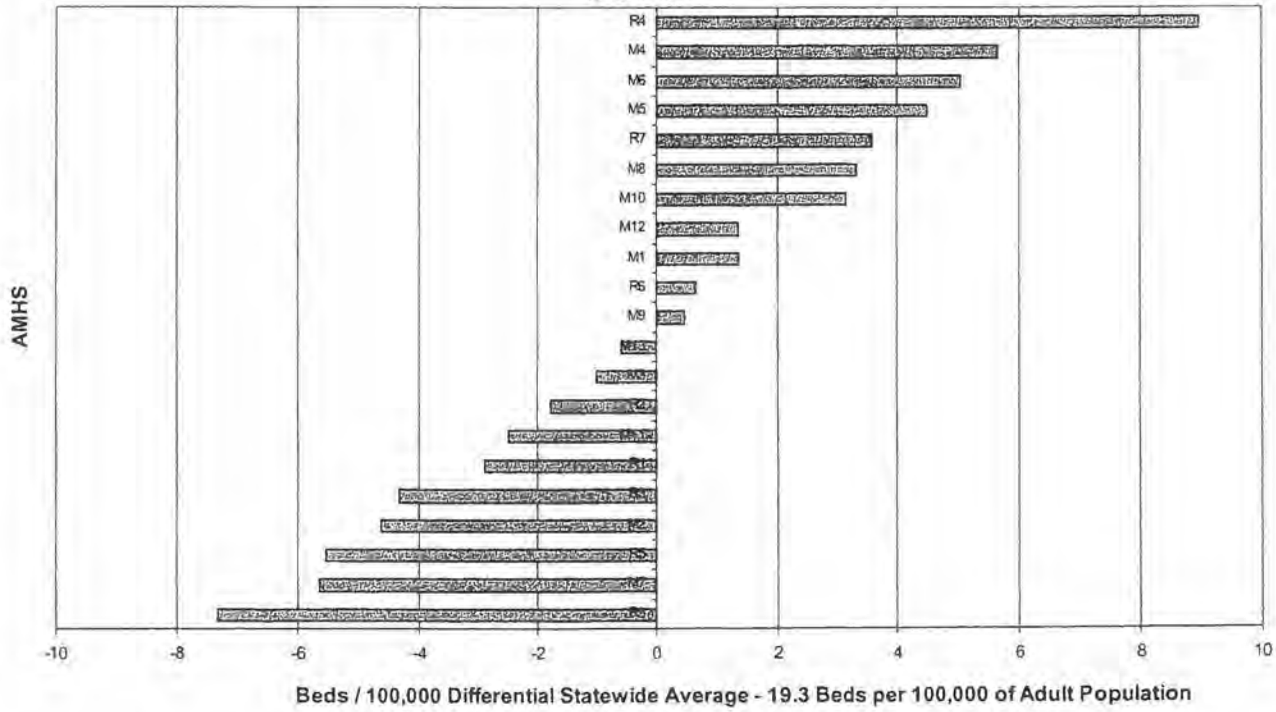
Stakeholders outside mental health services saw the present system as unworkable especially with regard to continuity of care.

Other parts of the health system in Victoria have similar issues around maintaining access to scarce inpatient beds that meet regional needs. The Review team was given examples of management strategies that appear to operate better than those in mental health.

The challenge of understanding area self-sufficiency issues is evident from the previous discussion of a threefold variation in rates of bed access between services, even when those demographic differences that serve as a proxy for need are taken into account.

Chart 4 shows the adult acute inpatient beds per 100,000 of the population aged between 18-65 years in the catchment area of each mental health service, standardised to control for the effects of differences in age, sex, marital status and social deprivation. We describe the methods behind this analysis and its limitations elsewhere (see *Appendix 3 — Methodology)*.

Chart 4: ***Standardised Adult Acute Beds per 100,000 by AMHS - Actual Beds Adjusted***



The average number of adult acute inpatient beds per capita across Victoria is 19.3 per 100,000 of the adult population. There is a two-fold variation in adult acute inpatient beds per capita standardised between area mental health services. The chart suggests an inequitable distribution of acute inpatient beds across Victoria, since it is unlikely that high use patient differences or non-linear demographic effects can explain a difference of this magnitude. It illustrates that full area self-sufficiency cannot be expected with the present distribution of inpatient beds.

Data from PRISM for 1999/2000 show that out-of-area admissions are a significant proportion of the separations recorded by every service. The percentage of discharged patients who provided a residential address within the catchment area of the inpatient unit that admitted them varied between 63-91% for metropolitan services and 78-98% for rural services. There were 1758 out-of-area separations (14% of all separations) in that year.

3.9.1 Organisational and Funding Issues Related to Area Self-Sufficiency

It can be argued that the overall number of acute inpatient beds across Victoria is adequate, as suggested by the total number of available beds and inpatient ward occupancy rates. Therefore the system must find ways to enhance access to available beds in the short term. In the longer term if the policy goal is achieving area self-sufficiency this will require either a different funding process or a different distribution of inpatient beds or both.

Almost all service providers state that the current acute bed management system and the financial incentives for acute bed self-sufficiency need improvement, but there is no agreement about an alternative. This is not a recent phenomenon. A previous attempt at operating a centralised "bed bureau" in metropolitan Melbourne, which did not incorporate electronic data management or financial incentives, failed due to lack of voluntary cooperation between services (Buckingham, 1993). Nor is the problem limited to Victoria. New South Wales is currently developing its own system for payment of out-of-area admissions, although more work is required.

In Victoria currently there is no single point of responsibility for the out-of-area admission system. This aggravates communication difficulties that arise in the negotiation for out-of-area admissions, especially after hours. Enhanced recording of bed availability through the RAPID (Redevelopment of Acute and Psychiatric Information Directions) data management system may help but is unlikely to prevent the need for senior level clinical responsibility of this clinical process. The Review team formed the opinion that an interim centralised system to manage bed access should be introduced.

As an alternative to applying financial incentives to drive unrealistic area self sufficiency, it may be more appropriate in the short term to fund services for the bed days they provide regardless of the geographical origin of the patient requiring the bed. Such funding should be on a standard bed day cost that does not differentiate between the day of admission and subsequent days. Establishment of a centralised system to manage bed access may assist accounting for this funding.

While there is a measure of agreement that funding services who provide out-of-area bed days is equitable, there is widespread disagreement about how such a system might operate. These disagreements originate in the recognition of a number of factors that are not necessarily consistent, for example that:

- continuity of clinical care is most readily achieved by full area self-sufficiency and future funding arrangements should encourage this.
- funding services for more or less than the numbers of inpatient beds they require may promote inappropriate practices.
- services that have already changed their pattern of service delivery to promote area self-sufficiency should not be disadvantaged by any new arrangements.
- historical patterns of over- or under-supply of inpatient beds should not lead to financial advantages or disadvantages in the future.

Notwithstanding these justified concerns, it is the view of the Review team that in the short term the most pressing requirement is for an out-of-area admission system that works better than the present one. In this situation services may have to accept a less than optimal arrangement.

The Review team considers that it is worthwhile to initiate an interim system that refines funding allocations for inpatient beds and financial incentives for area self-sufficiency through successive iterations, while the longer term issues of the equitable distribution of inpatient beds and the payment options are being addressed.

A number of options for how the financial aspects of an interim system might operate have been suggested:

- Option 1. Services receive fixed funding for inpatient beds, within their overall population-based funding grant, set to approximate more closely levels of service utilisation suggested by relevant demographic factors. When an out-of-area admission occurs, the referring service pays the admitting service for the duration of the admission based on the standard bed day rate.
- Option 2. Services receive funds for their complete range of services based on the population-based formula but some of the funds are held in a central equalisation account for proportional distribution after reconciliation of services' cross-boundary admission flows, based on standard bed day costs.
- Option 3. Services receive funds for their complete range of services based on the population-based formula and are required to make contractual arrangements amongst themselves to handle excesses and shortfalls of acute inpatient capacity.

Other financial arrangements may be possible. The Review team considers that the Mental Health Branch needs to achieve an early agreement with services about these aspects of an interim centralised system to manage bed access.

The recommendations of the *Ministerial Review of Health Care Networks* (Duckett et al, 2000) may have an impact on area self-sufficiency with respect to inpatient beds. Previously an opportunity existed for health care networks to manage out-of-area beds from within the same organisational structure. The impact of having a larger number of smaller services is not yet clear. The catchment area changes recommended by the *Ministerial Review* will also affect overall population-based funding to area mental health services.

3.10 Recommendations

It is recommended that:

1. Mental Health Branch develops plans to identify and where appropriate, address the inequitable geographic distribution of acute adult inpatient beds.
2. Mental Health Branch works with service providers to understand better the relationships between service structure, clinical practice and area self-sufficiency for individual area mental health services.
3. Mental Health Branch, as an interim approach, supports the establishment of a system to manage out-of-area admissions that:
    a. takes centralised responsibility for monitoring and allocating adult acute inpatient mental health beds across Victoria.
    b. enables better communication of inpatient bed availability.
    c. establishes a functional system of financial incentives for area self-sufficiency.
4. To emphasise the importance of area self-sufficiency in acute psychiatric inpatient services, Boards of Metropolitan Health Services and rural hospitals periodically report "out-of-area" activity.
5. Mental Health Branch publishes service data on inpatient beds self-sufficiency in the public domain.

4 EFFICIENCY

Efficiency refers to maximising benefits (or outcomes) for a given cost. The three major issues relevant to service efficiency discussed by Review participants were length of stay, levels of staffing and distribution of financial resources.

4.1 Length of Stay

There is a widely held perception that average length of stay for patients admitted to adult acute inpatient units in Victoria has decreased in the last five years, with negative consequences for patient care. In particular, consumers and carers spoke of patients being "pushed out" of hospital with inadequate discharge arrangements. Community services, primary care providers and disability support services supported this perception.

Other opinions on length of stay were put to the Review. It was stated that a proportion of patients stayed in hospital too long because of difficulties with discharge arrangements and hence inappropriate use of beds beyond clinical need.

We were unable to identify any reference point for an "ideal" length of stay in an inpatient unit, either from informants or from the research literature. The divergent comments mentioned above illustrate a tension evident in health services research, which argues that every discharge decision is a trade-off between continued use of costly, high-demand, inpatient services against the likelihood of his or her readmission in the future. These decisions must be based on clinical need, but may require balancing the needs of a patient who has already received a period of inpatient care against those of a patient who has yet to be admitted.

PRISM data supports the view that length of stay has decreased from an average of 19.6 days in 1994/95 to 13.7 days in 98/99, but such averages may conceal a range of complexities. For example, anecdotal reports suggest there has been a significant increase in short, 1-2 day, admissions over this same period due to an increase in "crisis admissions" and incentives to transfer out of area admission patients back to a referring service within this period. Both these factors would lower mean length of stay without necessarily supporting the argument that discharge was occurring too soon.

Chart 5: ***Number of 1 Day Admissions, 2 Day Admissions and Admissions of longer than 35 days - Adult Acute Units July 95 - June 99***

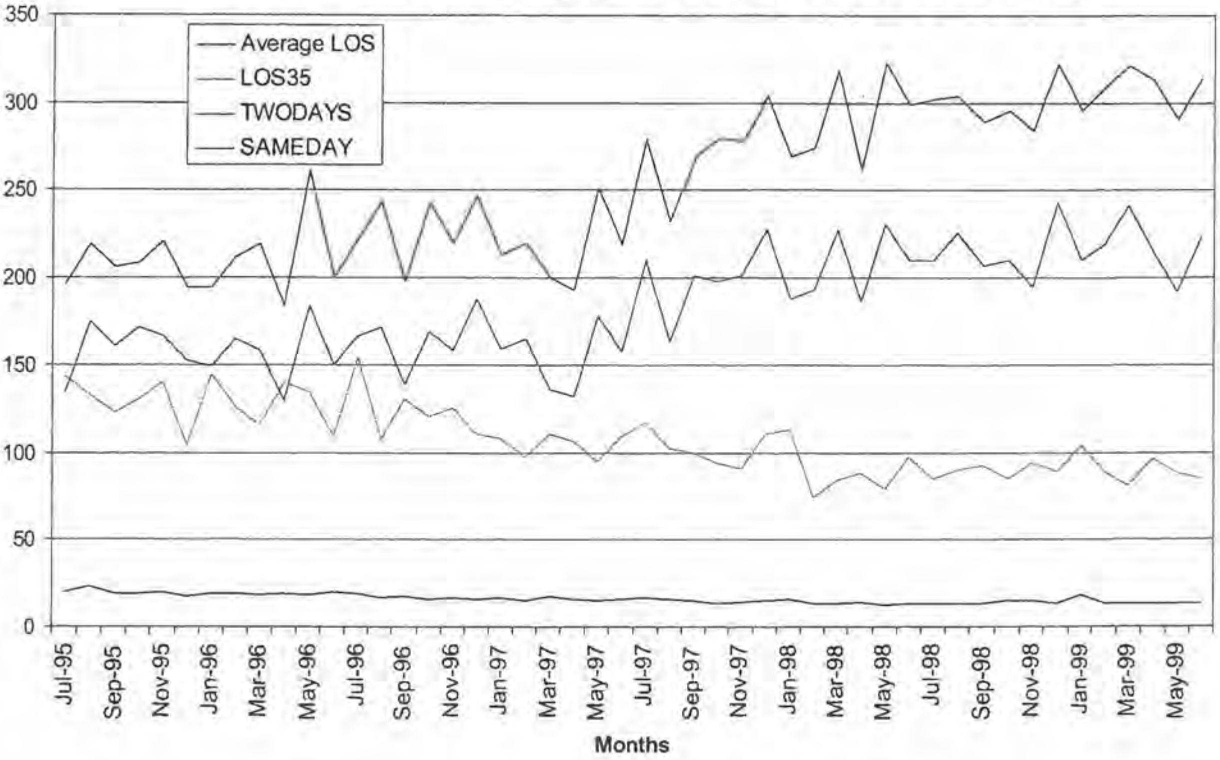
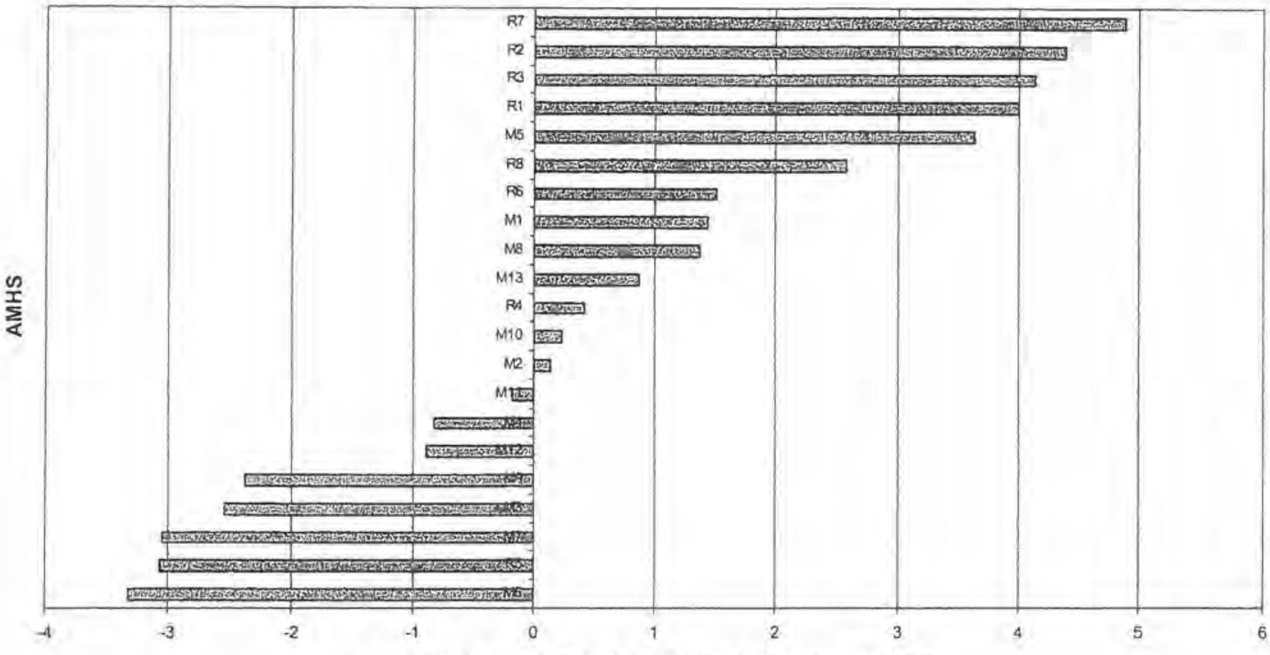


Chart 5 illustrates the numbers of 1 day admissions, 2 day admissions and admissions of longer than 35 days to all Victorian adult acute inpatient units by month since June 1995. While both the first two parameters have steadily increased over this time, the numbers of long-term admissions have slowly decreased. These data confirm the anecdotal reports provided to the Review and suggest that firm conclusions about length of stay data are unwise.

Chart 6 standardises length of stay for demographic differences across catchment areas. It indicates a two-fold variation in length of stay between services, even after controlling for differences in the demographic factors associated with overall need for care within a catchment area. Once again, this indicates that most of the variation in length of stay can be attributed to differences in models of service delivery and clinical practice.

Comparing Chart 6 with Chart 2 (*Section 2.8*) service by service provides some evidence that longer lengths of stay correlate with disproportionately high access to community based care. Services at the top of each chart, predominantly rural, have longer lengths of stay and higher utilisation of community care. Services at the bottom of each chart, predominantly metropolitan, have shorter lengths of stay and lower community care utilisation rates. While this may indicate a discontinuity between inpatient and community care components of services generally, it may also, once again, reflect that a limited range of treatment options is available in rural areas.

Chart 6: ***Standardised Adjusted Adult Acute LOS by AMHS***



4.2 Levels of Staffing

There were widespread comments on levels of staffing in acute inpatient units across all professional disciplines.

Nursing was a particular concern. It was acknowledged that there is an excessive reliance on additional overtime or casual agency staff to cope with regular shortages. Providers identified a range of difficulties relating to recruitment and retention of nurses. These include a high level of stress reported in contemporary inpatient units; diminished availability of in-service training; inadequate encouragement in nurse training to consider mental health as a career; a lack of mentoring and support on the wards; and a lack of experience of the workforce overall, and of clinical tutors in particular.

Some services offered examples of initiatives to address these difficulties. These include appointment of clinical nurse educators and active involvement of staff in the development of models of care. There was some optimism about positive outcomes possible from the *Nursing Recruitment and Retention Sub-Committee* established by the Minister for Health.

Similar concerns were raised about the recruitment and retention of psychiatrists. This is a major problem, especially for rural services, and is not confined to Victoria (AMWAC, 2000) Lower remuneration associated with fringe benefits tax changes was raised as a particular issue for this professional group. The impact of recently negotiated changes to medical practitioner salaries has yet to become apparent.

Several informants noted a decrease in the availability of sessional psychiatrist positions within inpatient units that had accompanied the increased emphasis on community care. While possibly fostering improved continuity of care for the patients of those psychiatrists who remained, this change was also thought to reduce the flexibility of medical staffing on inpatient units and to negatively affect the integration of public services with the private sector.

Many informants noted that numbers of allied health staff in inpatient units had declined. Some of this decline was attributed to decisions by management to concentrate these resources in community settings. Consumers and carers in particular complained that activity programs in inpatient units had decreased and ascribed this to staff shortages. This is, however, not the only possible explanation, changing client characteristics and patterns of length of stay may also be relevant factors. There were some examples of innovative activity programs developed to meet the requirements of current inpatient environments, but little evidence that these initiatives were well known outside their home service.

4.3 Distribution of Financial Resources

4.3.1 Funding and Expenditure

Review of National Mental Health Report expenditure data (ref NMH report 97/98) revealed that acute bed-day costs in Victoria *reduced* in real terms between 1992-1998 (2% for stand alone, 13% for co-located) compared to *increases* of 14% and 2% nationally. However, it can be argued that part of these changes relates to other states catching up to Victoria. In addition, the broad service changes that occurred in Victoria over this period, in particular the move from non-acute hospital inpatient services to develop a range of specialised community care facilities (including, for example, residential rehabilitation services), complicates direct comparisons.

The Review also analysed 1998/99 expenditure data supplied by individual services. This analysis revealed a gap between the bed-day price paid by Mental Health Branch ($311) and the average cost per funded bed-day reported by services ($349). Estimates reported in the *National Mental Health Survey 1998/99 (draft)* for Victoria averaged at $399. (This confirms the widely held view of providers that current prices are too low, that the cost modelling for acute inpatient bed day is outdated and that an urgent review of prices paid is required). This preliminary information suggests some variation between the funding of services and actual cost per bed day for acute inpatient care.

These average bed day costs conceal a $140 variation between the highest and lowest costs reported, and such wide differences were typical of much of the data. Average ward occupancy rates varied between 39-118% (median=87%). The costs of casual nursing staff and nursing overtime together as a percentage of the total nursing budget for acute adult inpatient units varied between 1.5-37.5% (median=9.2%). The ratio of administrative and corporate charges levied on area mental health services to total service budget varied between 3-16% (median=10%). Reported pharmacy costs per occupied bed-day varied between $1.97-17.69 (median=$8.76). Staffing profiles differed significantly.

The Review team formed an opinion that in addition to funding and service cost variations, there are differences in the structure of services, some historical and some related to economies of scale, which account for these variations. There are also differences that can be attributed to clinical practice variations, as is implied by different staff profiles and expenditure on pharmaceuticals.

On the data provided it is not clear that an increase in funding for adult acute inpatient services (across the board) will address all service expenditure issues identified. It will be important to ensure that routine benchmarking between like services on efficiency indices is established.

4.3.2 Financing

Regardless of the amount of funds provided, analysis of the process by which funds are distributed from Treasury to individual mental health services reveals complexities. Currently each layer of administration (Treasury, DHS, Aged Community and Mental Health Division, Mental Health Branch, Regional offices, Health Services, Area Mental Health Services) has opportunities to adjust the distribution of resources. Although activity targets are set centrally the policies that influence funding allocations are regarded as guidelines only. Stakeholders at each lower level generally believe that funds are adjusted at each level above. The level of detail in allocation grows with each layer, accompanied by increasingly detailed activity targets that produce de facto funding silos. Services have limited flexibility to adjust service configurations to address local needs, because these are determined from a distance via activity targets and funding allocations, a process termed "micromanagement".

Accountability mechanisms are unclear. Services are held accountable for activity targets but do not report expenditure against each funded service component. Given the relatively weak relationship between activities and financial allocations, only limited inferences can be gained from activity monitoring. Consolidated reporting at the Health Service or regional hospital level creates a lack of accountability for mental health, and means that assuring preservation of funds for mental health purposes ("quarantining") is lost. One unintended consequence of this process is the acknowledged practice of allowing community based services to subsidise inpatient beds so that community allocations are essentially what is left after meeting funding commitments and formula funding requirements for bed based services. In effect this achieves the exact opposite of the stated central policy of prioritising community based care.

The *Ministerial Review of Health Care Networks* (Duckett et al, 2000) also commented on this process, noting inefficiencies within health funding processes generally and in Aged, Community and Mental Health Division in particular. Recommendations 65, 67, 68, 71, 74 and 77 relate specifically to improving funding processes in this Division, and each has been agreed in the Department of Human Services response. The general intent of these recommendations is to increase transparency and accountability in funding and to decrease "micromanagement", all conclusions endorsed as necessary by this Review. It should also be noted that recommendations related to the creation of new Metropolitan Health Services, realignment of catchment areas and reduction in the role of metropolitan regional DHS offices all have particular implications for the mental health funding process.

4.3.3 Alternative Funding Models

There is some debate about a range of alternate funding models for mental health services that are under consideration at different levels of government across Australia. These include episode-based funding, casemix and adjusted casemix models and population funding models based on outcomes. Each of these models takes an inclusive view of funding that goes beyond the individual components of a mental health service system, such as the acute adult inpatient facilities considered by this Review.

The Review team is aware of the importance of an overall funding model to provide incentives for the appropriate distribution of service resources and their efficient use. We are also aware of the contributions made to the debate from within Victoria and the development work that is continuing in this area.

In our opinion the restricted scope of this Review and the continuing development of models make a final recommendation about a suggested funding model for acute adult inpatient services inappropriate at this stage. Hence our recommendations are confined to improvements in accountability and transparency of current funding and financing.

4.4 Recommendations

It is recommended that:

1. Mental Health Branch assists area mental health services to develop options that increase the current permanent workforce and reduce use of casual staff and overtime payments.
2. Mental Health Branch supports service evaluation research that leads to greater understanding of the relationship between staffing structures, career paths, work environments and clinical practice.
3. Mental Health Branch reviews the current funding model for acute inpatient units and identifies future resource requirements to address differences between price paid and cost.
4. Mental Health Branch addresses the service and resource implications of the recommendations of the *Ministerial Review of Health Care Networks*.
5. Mental Health Branch develops and implements over the next 12 months a new purchasing policy in relation to adult acute inpatient mental health services that:
    a. achieves greater alignment between activity and financial accountability.
    b. reduces micro-management of local services.
    c. provides appropriate incentives for greater flexibility in service configuration to meet local needs.

5 APPROPRIATENESS

5.1 Overview of the issues

As mentioned previously, the Review team found little consistency in stakeholders' views of the purpose of an acute inpatient admission. Without this reference point it is hard to judge the appropriateness of care provided.

Appropriateness is generally defined as ensuring the right patients receive the right treatment at the right time and in the right location. Ensuring the right patients are admitted means that prioritisation for admission to beds should be made on the basis of acuity, urgency and risk. The thresholds for admissions using these criteria must be transparent and consistent across services.

Ensuring patients get the right treatment means that inpatient admission must be identified as the optimum management for that patient at that time. Inpatients stays should not occur simply because there are no available alternatives — a situation the Review team was told does occur at times, including when discharge is delayed because of a lack of supported accommodation options.

Increasingly, services internationally seek to establish the appropriateness of their care by reference to external standards such as authoritative clinical guidelines. In the United States, for example, the American Academy of Child and Adolescent Psychiatry in conjunction with the American Psychiatric Association have published *Criteria for the Short-Term Treatment of Psychiatric Illness* (1997). This document specifies criteria for individual patients that indicate requirements for different levels of care. While the document carefully indicates that it "should not be interpreted to be absolute rules for determining the level of care required by every patient", it does provide a framework that supports the appropriate exercise of clinical judgement

5.2 Consumer Experience of Inpatient Care in Victoria

In general, the consumer experience of inpatient care was reported as predominantly negative. The general impression was that consumers and carers felt a sense of allegiance with inpatient staff and did not blame them for what they perceived as system deficits. Service providers acknowledged that they sometimes felt uncomfortable with the standard of care they were able to provide. The criticisms described the inpatient environment as reactive rather than proactive, overly custodial and frequently threatening.

Many comments were received about the difficulty of establishing therapeutic relationships with staff due to pressure of work, roster arrangements, staff shortages and what was referred to as a "nursing station culture" that was seen to limit staff time in general ward areas.

5.3 Staff Experience of Inpatient Care in Victoria

Since the publication of the *Framework* document in 1994 community mental health services in Victoria have developed considerably. Many believe that these developments have occurred at the expense of acute inpatient units.

It was reported that many acute inpatient services see themselves as poorly treated and undervalued while being expected to undertake the most challenging work. Informants indicated that there are declining resources, inadequate staff numbers and expertise and low morale and appear to believe that developments in service delivery have overlooked their particular skills.

Several informants noted that career structure incentives over the last 5 years have encouraged experienced nursing staff to take up community positions at the expense of inpatient services. There is a general view that acute inpatient staff in all disciplines are less experienced than they used to be.

It was also reported to us that there are too few opportunities for staff learning and development in inpatient services. Examples of innovative practice in acute inpatient units across Victoria were frequently unknown outside their local area. There were many comments that opportunities for in-service training have declined and that the current work creates little opportunity for intellectual stimulation.

The Review team are of the opinion that a revitalisation of acute inpatient services is overdue. Advances in inpatient care internationally and locally have not received an appropriate level of attention. We consider that Mental Health Branch should provide the same focus for developments in acute inpatient services that has been provided in community mental health services.

5.4 Variations in Practice

5.4.1 High Dependency and Observation Issues

Against this broadly critical background, the Review noted large variations between units in policies and clinical procedures in a wide range of areas for example, the use of high dependency units (HDUs). Some services do not have these facilities, others do but they are rarely used. Others use them a lot. Arrangements for monitoring and supervision of patients placed in HDU varied. Some consumers reported that seclusion appears sometimes to be used without consideration of alternatives. Services use the presence or absence of available HDU beds as a crucial element in negotiations about accepting out of area admissions despite Office of the Chief Psychiatrist policy that this should not occur (Department of Human Services, 1999).

It was reported that the requirements for staffing HDUs place pressure on already limited staff resources and exacerbate the difficulties in achieving therapeutic staff-patient relationships. Staffing requirements for constant observation protocols were reported to have a similar effect.

5.4.2 Locked Wards

The Review was told that several inpatient units operate with their doors locked most of the time. Services acknowledged this practice and described various reasons for it.

The Review team formed the opinion that there is a tension between the requirement for services to provide the least restrictive environment for patients, as mandated by the Mental Health Act, and a duty of care to ensure patients' safety. Carer groups emphasised concerns about absconding and inappropriate behaviour when patients are inadequately supervised.

The Office of the Chief Psychiatrist indicated that there is no Mental Health Branch policy about locked doors on acute inpatient units, although "generic brief" design specifications for inpatient units imply that they should not be locked as a general rule. It is the view of the Office of the Chief Psychiatrist that wards should not be locked routinely since, in general, safety issues can be managed in other ways. On the other hand the concept of the "least restrictive environment" should not compromise the provision of necessary treatment.

The Review team considers that policy in this area requires further clarification.

5.4.3 Activity Programs

Another aspect of inpatient units showing wide practice variation is the nature of activity programs in the ward. It was reported that available activity programs are less common and less productive than in the past. Where present they appeared to be valued for their perceived role in reducing boredom, aggressive behaviour and illicit drug taking.

There was a widespread belief that the short lengths of stay common for many inpatients has led services to reduce resources for activity programs. Sometimes there was reported to be a reliance on external agencies such as consumer consultants or psychiatric disability support agencies to provide activity programs. Again, one of the problems identified by the Review is that lack of clarity about the purpose of an inpatient admission creates differing expectations about what activities inpatient services ought to provide.

5.4.4 Discharge Planning

Discharge planning was confirmed as an important issue, especially for carers, and was the subject of many submissions. Informants described numerous examples of inappropriate discharge planning that included inadequate support arrangements or poor communication with carers or other agencies.

Informants described service gaps that hindered effective discharge planning, including inadequate "step down" facilities, scarce supported accommodation and limited rehabilitation options, especially in rural areas. Several internal systemic issues were identified as important considerations in discharge planning, such as liaison with community case managers, expertise of inpatient staff in coordinating community supports, and the influence of bed demand pressures affecting discharge dates.

The Review team formed an opinion that inpatient staff were frequently operating in an excessively pressured environment that prevented them from adequately considering continuity of care issues. It was clear that there were large variations in clinical practice between areas, with some having developed better integration between inpatient and community based staff than others. Discharge planning was not universally inadequate and there were several good examples provided. Unfortunately, it appeared that opportunities for service managers to compare and contrast the practices of their services with like services were limited. Similarly, benchmarking between similar units is limited and would be an incentive for wider dissemination of good/successful strategies.

The Review sought information about collaboration between inpatient services and the private sector, primary care and other services. It was apparent that this is still quite embryonic with many small pilot programs in single settings in place. Experimental "shifted outpatients" programs in metropolitan primary care have not been widely developed. A large scale, federally funded, integrated care initiative is now underway in central Melbourne and the results are awaited. Partnerships with general practitioners appeared strongest in the rural sector.

The Review team formed the opinion that one major contributory factor to the difficulty in managing bed demand and stress on inpatient units is the common tendency for solutions to be sought internally. Inadequate attention and resources are being directed towards improving the relationships with other aspects of the health sector generally. Where this is occurring, generally the inpatient unit is coping better with demand.

5.5 Appropriateness: Quantitative Data

The quantitative data available provided less information about the appropriateness of care that the other quality domains.

Some of the data already presented indicate significant variations between services in aspects of care that raise questions about appropriateness. For example, three-fold variations in admission rates after standardisation for population differences were illustrated in Chart 1 and discussed in Section 2.8.

The Review team questions whether all the admissions to services with high admission rates are indeed appropriate, or whether in these circumstances admission is substituting for other forms of care. Similarly we question whether the low admission rates amongst services at the other end of the scale are appropriate, or whether in these circumstances admission is being denied because of bed availability. It is not possible within the Terms of Reference of this Review to answer these questions.

Variations were also identified in other aspects of service provision relevant to appropriateness, for example, ECT provision, and the use of medications, high dependency units and seclusion. It is not currently possible to provide meaningful comparative analyses of all these data.

The Review team considers that further development of comparable, quantitative, indicators of the appropriateness of clinical services should occur and that such performance indicators should form one aspect of comparative benchmarking between like services. The Quality Assurance Committee recently constituted by the Office of the Chief Psychiatrist may play a role in this regard.

5.6 Recommendations

It is recommended that:

1. Mental Health Branch encourages stakeholder debate and discussion to establish a more definitive view of the purpose of acute psychiatric admission.
2. Mental Health Branch develops policy and procedure guidelines related to inpatient admission that reflects this view.
3. Mental Health Branch works with services to assist improved sharing of innovative ideas about inpatient services.
4. Mental Health Branch clarifies policy with regard to locked doors on adult acute inpatient units.
5. Mental Health Branch ensures that the Office of the Chief Psychiatrist reviews relevant aspects of service appropriateness and reports data in the public domain on a regular basis.
6. Mental Health Branch, with providers, develops strategies to achieve a more comprehensive and integrated outcome for mental health consumers.

6 EFFECTIVENESS

6.1 Overview

Boyce et al (1997) define effectiveness as 'the degree to which an intervention produces measurable increases in survival or improved quality of life (or improved outcomes) when applied in routine practice'.

There is considerable international interest in the measurement of the effectiveness of mental health care (Lelliott, 1998). The *Second National Mental Health Plan* (Australian Health Ministers, 1998) makes the improved measurement of quality and effectiveness one of its three priority areas. The *Ministerial Review of Health Care Networks* (Duckett et al, 2000) makes several recommendations designed to achieve the same results.

Research in Australia (Boot et al, 1997; Callaley et al, 1998; Pirkis et al, 1999) demonstrates that routine measurement of outcome in ordinary mental health settings is achievable and valuable. The Victorian Mental Health Outcomes Project has developed measures suitable for use in public mental health services (Aged, Community and Mental Health Division, 1999b) and elements of this program will be incorporated into the new RAPID clinical data management system.

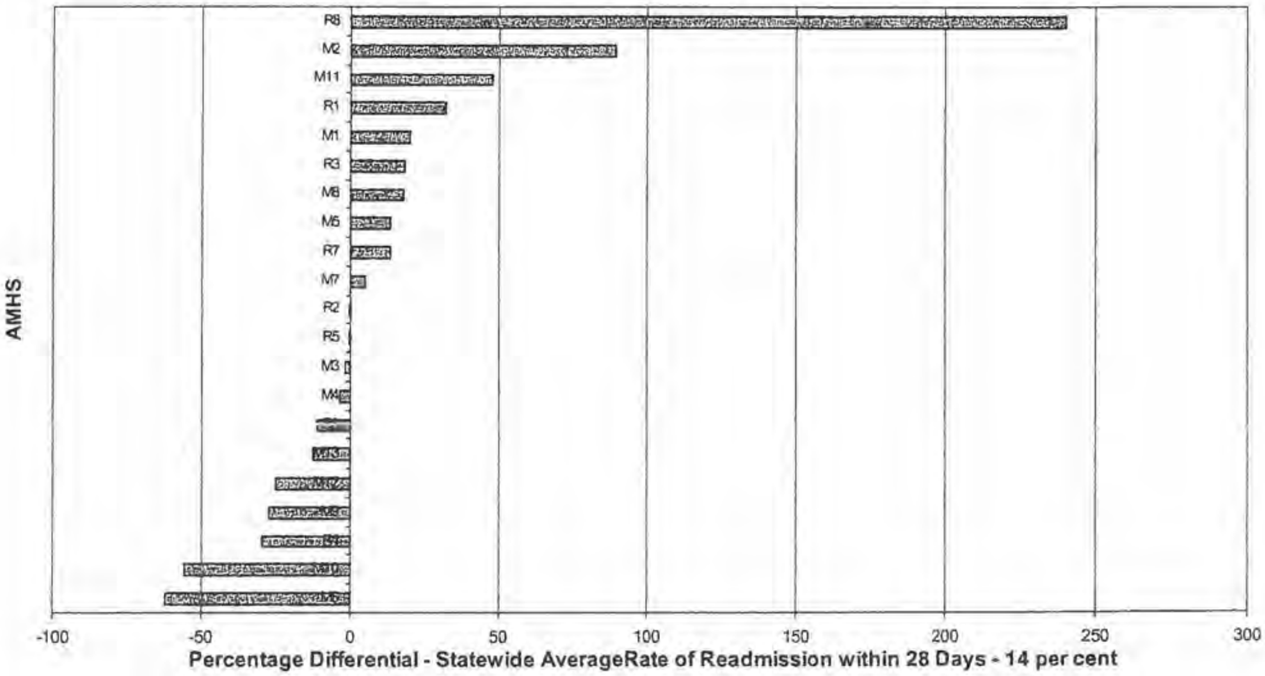
6.2 Measurement of Effectiveness in Inpatient Units in Victoria

The Review team identified few examples of systematic evaluation of the clinical effectiveness of acute mental health services, indicating low take up of national and state policy initiatives at this stage.

We observed significant variation in those process measures that are considered to be proxies for effectiveness of inpatient stay.

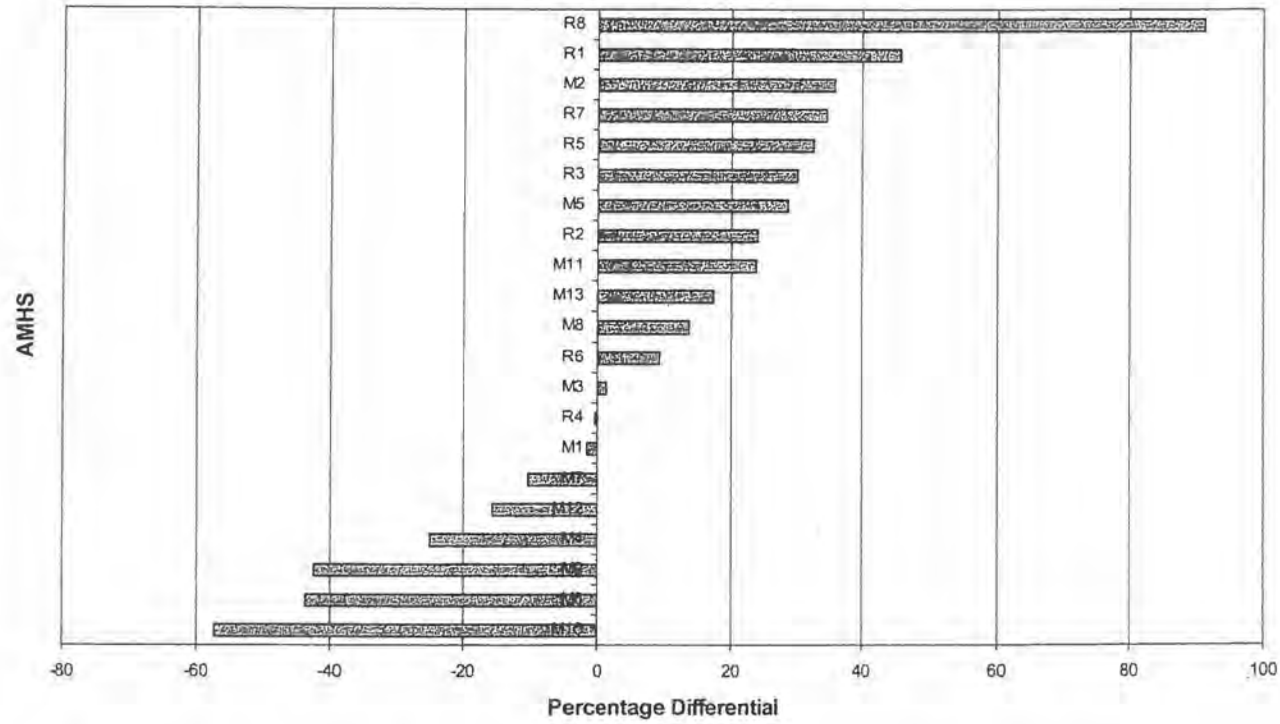
For example, Chart 7 illustrates rates of readmission within 28 days of discharge, standardised for differences in age, sex, marital status and socio-economic deprivation between each catchment area (see *Appendix — Methodology*). The data show that the 28-day readmission rate varies three-fold across catchment areas.

Chart 7:
Standardised Readmission within 28 days to Acute Units by AMHS



Contact with community mental health services in the week before admission is an effectiveness measure that relates more to continuity of care throughout the service system than to inpatient services alone. Using an identical procedure to the previous analyses (see *Appendix — Methodology*), Chart 8 demonstrates the range of pre-admission contact rates with community services across catchment areas, controlling for differences in age, sex, marital status and socio-economic deprivation. These rates vary more than three-fold between catchments.

Chart 8: ***Standardised Community Involvement in Week Preceeding Adult Acute Admission by AMHS***



Each of these analyses indicates differences in the effectiveness of the care process that are unlikely to be explained by demographic and socio-economic variables.

6.3 Recommendations

It is recommended that:

1. Mental Health Branch requires, within service agreements, that area mental health services demonstrate progress in outcome measurement to achieve:
    a. comparative benchmarking with peer services
    b. processes to address unjustifiable variation in outcomes.
    c. better understanding of the purpose of, demand for and impact of their programs.

7 SAFETY

7.1 Overview

Concerns about safety in Australian health care systems are widespread and are being addressed through the establishment of the Australian Council for Quality and Safety in Health Care. It is fitting that safety for both consumers and staff in the acute psychiatric inpatient environment was raised as a major issue during the Review.

Issues of safety in psychiatric settings most commonly concern unexpected side effects of psychotropic medication, patient self-harm and suicide and aggressive and violent behaviour occurring as a complication of illness or drug intoxication. These issues have been widely researched (Bensley et al, 1995; Grainger & Whiteford, 1993; Morrison & Lehane, 1995; Whittington & Wykes, 1994.)

In the United Kingdom the Royal College of Psychiatrists has addressed this issue through development of evidence-based clinical guidelines for *Strategies for the Management of Disturbed and Violent Patients in Psychiatric Units* (Royal College of Psychiatrists, 1996) and recommendations related to the design and physical features of acute inpatient units (Royal College of Psychiatrists, 1998). In Victoria, recommendations have been developed which relate to the provision of gender safety (Mental Health Branch, 1999) and the physical design of inpatient facilities (Department of Human Services 1996b).

In the United Kingdom, provision of gender-specific areas on inpatient units is an official policy, although a survey in 1997 found that only 36% of female inpatients had access to them at that time (Ford et al, 1998).

7.2 Concerns about Violent Behaviour

Many consumers and staff expressed concerns about safety on acute inpatient units. The Review received a number of requests for provision of gender-safe areas and practices on inpatient units.

Concerns from staff were articulated particularly by recent graduates who reported feeling threatened and unsupported. Staff attributed part of the perception that they spend a lot of time in the nursing stations to these fears. Some consumers stated that staff inexperience has the potential to aggravate the risk of violent behaviour.

7.3 Drug and Alcohol Problems on Inpatient Units

Comorbidity of mental illness with substance or alcohol misuse is a major issue recognised by all stakeholder groups. A recent survey of every Victorian acute inpatient unit showed that incidents of illicit drug use are reported frequently. The staff perception is that drug and alcohol misuse account for significant levels of psychopathology and violent behaviour on acute inpatient units.

The general perception is that drug and alcohol misuse by inpatients is an increasing problem. The Review team noted that there are no standard policy responses to prevention and management of drug and alcohol use in inpatient settings.

Of particular concern is the contrast between "harm minimisation" policies adopted at the political and public health level and the "zero tolerance, prohibition" approach of most inpatient units. Staff report confusion about their clinical, medicolegal and ethical responsibilities when dealing with drug and alcohol misuse. There is widespread support for development of central policy.

The Review team formed the opinion that formal acknowledgement should occur of the widespread comorbidity of drug and alcohol use with mental illness. This should then be followed by development of a comprehensive approach to the issue, which would include:

1. clarification of central policy and strategy
2. intensive staff training in a range of prevention and management strategies
3. support for the development of more innovative pilot projects which examine a variety of different approaches
4. greater collaboration between mental health and drug and alcohol specialist services
5. commissioning service evaluation research into the effectiveness of approaches to this problem.

7.4 Physical Design

It was reported to the Review that there are a number of concerns about the physical design of inpatient units, which contribute to greater difficulties achieving optimal safety. Examples provided included the spatial relationships of seclusion facilities to the central nursing station and the design and provision of high dependency facilities. These concerns appeared to be significantly less in the more recently designed inpatient units, which suggests that solutions could be progressively incorporated across the system as units are renovated and commissioned. The Royal College of Psychiatrists' consultation document, *Not just bricks and mortar* (1998), makes relevant comments on these issues.

Besides specific safety issues, consumer and carer informants mentioned the influence of physical design on the establishment of a therapeutic environment. Several informants believed that units within mainstreamed facilities offered fewer opportunities for reflection and recreation, because of design features alone.

7.5 Training

There was variation apparent between services in the provision of training to staff regarding the broad issues of safety. Where it was occurring, services reported positively on the benefits of targeted training related to safety issues, including aggression prevention and management and general occupational health and safety.

Many services also expressed a need for increased access to expertise of those statewide and specialist services that had a particular interest in safety issues. These specifically included services for management of personality disorders and for comorbid mental health and drug and alcohol problems.

7.6 Recommendations

It is recommended that:

1. Mental Health Branch develops a renewed emphasis on safety issues in psychiatric inpatient units at a central level and all area mental health services review their local policies and procedures in this area.
2. Mental Health Branch develops policies and guidelines on the identification, assessment and appropriate response to illicit drug use in acute adult inpatient units.
3. Mental Health Branch ensures a staff training and development program is provided across all mental health services that ensures a consistent approach to illicit drug use in acute adult inpatient units.
4. Mental Health Branch encourages initiatives that increase the use of the expertise of relevant statewide and specialist services in acute adult inpatient units.
5. Mental Health Branch ensures that all proposals to redesign, renovate or build acute psychiatric inpatient units satisfy contemporary standards for facility design.
6. Mental Health Branch requires that appropriate input from consumers and carers is obtained to both policy review and education and training in safety.

8 CONSUMER AND CARER PARTICIPATION

8.1 Overview

Victorian Government policy promotes consumer and carer participation in services as a priority issue. The Review found evidence that this was occurring. Service providers reported a strong commitment to fostering consumer and carer input and described a range of programs to support effective participation. Consumers generally acknowledged that significant gains have been made in increasing the opportunity for participation over recent years. However, the majority of consumer informants stressed the need to further this work and believed that implementation of particular policies such as *Victoria's Mental Health Service, Working with Consumers: Guidelines for Consumer Participation in Mental Health Services* (Department of Human Services, 1996) required further impetus.

This view is supported by the findings of an independent evaluation (Aged, Community and Mental Health Division, 1999), which found significant variation between services in the extent to which they had implemented consumer participation policies and practices. Some consumers described their experience as "tokenistic".

Carers similarly reported a lack of opportunities for input into the operation of acute inpatient services.

8.2 Consumer Participation in Inpatient Units

Many informants suggested that inpatient units generally were the least likely components of general mental health services to have adopted consumer participation principles. It was suggested that there was more room for staff training and education to support the involvement of consumers in this environment.

8.3 Consumer Consultant Roles

Consumer consultants reported high levels of stress associated with the role and believed that this aspect of their work is unrecognised. They also consider that increased resources should be available for consumer consultation.

While the consumer program is recognised as a key platform of consumer participation, the need for other avenues to provide consumer input were also raised. Many stakeholders feel current initiatives limit consumer participation to a small "core group of consumers."

8.4 Formal Mechanisms to Seek Feedback

Many consumers expressed concern that the annual consumer and carer satisfaction survey undertaken by the Mental Health Branch does not seek the views of consumers with recent inpatient experience. This view needs to be balanced by other expressed views about the appropriateness of surveying consumers during a period of acute illness.

Similarly, there was criticism of current procedure for handling complaints and the lack of any central collation and analysis of complaints. It was suggested that improvements in these areas would assist understanding of the consumer experience of inpatient treatment, and lead to improvements in inpatient services generally.

8.5 Carer Participation and Support in Inpatient Units

A number of submissions to the Review stressed the need to strengthen family and carer participation both in individual treatment decisions and in service planning and development.

Several adult acute inpatient mental health services have introduced carer information and support initiatives. Carer informants continue to report that provision of information and engagement from services is of critical importance while the person they care for is in hospital. Many carers believe that inpatient units are performing less well than community based services with whom they experience close consultation.

Carer informants suggest there is insufficient recognition of their expertise in looking after the person they care for. Many state that staff do not sufficiently consider their views in treatment planning. The Review team heard of a number of unfavourable incidents that resulted from inadequate consultation with carers contributing to less than optimal treatment and discharge decisions.

Many service providers and carers expressed concern regarding the impact on carers of looking after a family member with a mental illness. While family members generally willingly accepted this responsibility, many reported feeling unsupported in this role. In particular, carers emphasised the stresses placed on them in relation to discharge planning, access difficulties and decreased length of stay, which they felt should be better recognised by services.

Like consumers, many carers suggest that their involvement in adult acute inpatient services has been piecemeal and limited to "carer concerns" as defined by services. Carers believe they should have a larger and broader role in all aspects of service delivery.

8.6 Differing Expectations

It was apparent to the Review team that there is discordance between central policy directions and consumer and carer experiences, and between consumer and carer expectations and services' understanding of participation. Nevertheless, in our opinion these discrepancies are not unique to the Victorian mental health setting and reflect the slow evolution of understanding about how to achieve genuine consumer participation.

8.7 Recommendations

It is recommended that:

1. Mental Health Branch and services implement the recommendations of the *Evaluation of Consumer Participation in Victoria's Public Mental Health Services: Final Report* .

2. Mental Health Branch and services enhance the involvement of consumers and carers in all aspects of service delivery by:

    a. increasing the capacity for consumer and carer input to services.
    b. including consumers and carers in organisational management of services.

3. Mental Health Branch and services address the issues of inadequate support for and high stress levels of consumer consultants, particularly in rural areas.

4. Mental Health Branch and services identify opportunities to improve support for carers and develop initiatives to implement them.

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APPENDIX 1 – Project Team Membership

Project Leader

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Assistant Project Leader

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Project Team

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APPENDIX 2 – Reference Group Membership and Terms of Reference

Membership

- **Ms Nicole Ball**, ANF Representative, Banksia Ward, Dandenong Mental Health Services
- **Mr Peter Borthwick**, Manager, Goulburn Valley Area Mental Health Service
- **Dr Peter Doherty**, Director of Psychiatry, Inner South East AMHS
- **Mr Graeme Doidge**, HACSU Representative
- **Ms Bronwyn Farquar**, Monash Medical Centre
- **Mr Chris Gibbs**, Chief of Mental Health, North Western Health Care Network
- **Ms Tamara Irish**, Manager, Rural Mental Health
- **Ms Kim Koop**, Manager, Continuing Care Team, Koonung/Waverley Community Health Service
- **Associate Professor Jayashri Kulkarni,** Director of Psychiatry, Dandenong Hospital, Department of Psychiatry
- **Dr David Leonard**, AMA Representative
- **Ms Helen Long**, VICCAG (Victorian Community Advisory Group on Mental Health) Nominee
- **Ms Trish McAleer,** VICCAG (Victorian Community Advisory Group on Mental Health) Nominee
- **Mr Bernard McCormick**, VICCAG (Victorian Community Advisory Group on Mental Health) Nominee
- **Dr John Reilly**, Director of Psychiatry, Peninsula Healthcare Service
- **Mr Noel Renouf**, Northern Hospital
- **Ms Cath Roper,** VICCAG (Victorian Community Advisory Group on Mental Health) Nominee
- **Ms Trish Saunders**, Area Manager, Mid West AMHS

Reference Group Terms of Reference

- Provide advice to the Review Team
- Provide comment on review method
- Assist in understanding the meaning of the material arising from the review
- Provide comment on the draft report

Under these Terms of Reference, the Reference Group acted in an advisory capacity and had the opportunity to comment on preliminary report recommendations and findings, however the Group did not see or endorse the final report of the Review.

APPENDIX 3 – *Methodology*

The review methodology comprised two key processes — widespread consultation and consideration of available data.

Consultation

The consultation process included:

Semi-structured interviews with providers

Semi-structured interviews were held with all adult acute inpatient mental health service providers (a total of 21 interviews) concerning information relevant to each of the key Quality Domains.

Consultation Day

A focus group consultation day was held on 18 May 2000. The consultation day was attended by over 100 stakeholders including frontline service provider staff; consumers; carers; mental health special interest groups; representatives from other relevant mental health services (including area mental health services, child and adolescent mental health services, aged mental health services) and representatives from other relevant community agencies, including disability services, alcohol and drug services and the Police. Topics discussed within the focus groups included - access, the consumer experience, staffing, illicit drug use and relationships with other services.

Consumer specific consultation forum

A second consultation forum was organised in conjunction with the Victorian Mental Illness Awareness Council (VMIAC) and was attended by approximately 30 consumers from across the state.

Key Informants

Discussions were held with key informants nominated by selected professional organisations such as the Royal Australian and New Zealand College of Psychiatrists (RANZCP) and the College of General Practitioners. Other key stakeholders were consulted regularly through a variety of forums. For example Network CEOs, Partnership and Service Planning Managers, Area Mental Health Service Managers, Directors of Psychiatry and the Victorian Community Advisory Group on Mental Health (VICCAG) all received reports of review progress and were given an opportunity for input at their regular meetings.

Written Submissions

An advertisement was placed in each of the two major daily Victorian newspapers and the Department of Human Services web-site on 29 April 2000 calling for written submissions relevant to the aims of the review. (A copy of this advertisement and the proforma for submissions is available in Appendix 3.1). Submissions were received from approximately 40 respondents. These included submissions from consumer and carer advocacy organisations, individual consumers and carers, trade unions and a range of professionals working in both the mental health field and the broader health and community services sector.

Reference Group

Three Reference Group meetings were held through the course of the review. The Reference Group was established to provide advice to the project team about the review methodology and interpretation of findings. The Reference Group provided comment on but did not have final approval of the review recommendations. The groups include service managers, clinicians, consumer, carer and union representatives. (The Terms of Reference of the Reference Group and its membership are included in Appendix 2).

Information obtained through each of these consultation methods were considered thematically and a process of triangulation was used to identify those themes emerging as being of key concern to the range of stakeholders.

Quantitative Data

Detailed financial data was collected from each of the 21 adult acute inpatient mental health service providers. (The financial data survey is included at Appendix 3.2). This information was analysed in conjunction with Departmental financial records and data reported to the National Mental Health Survey.

Quantitative data from the PRISM (Psychiatric Records Information Systems Manager) and other activity and process data were analysed for general trends and were not used to draw detailed conclusions about individual services.

The main method of analysis used in the Review was standardisation, a technique that allows direct comparison of data between populations by compensating for differences in their demographics and risk factors. This process is described in detail below.

Standardisation of Data

Differences between Area Mental Health Services (AMHS) in service utilisation (e.g., acute beds per 100,000, length of stay or inpatient treatment rates, etc) can be explained in terms of three broad factors.

First, the differences may reflect different levels of absolute need in the catchment populations served by the AMHS (i.e., some areas have greater rates of psychiatric morbidity than others). Second, area mental health services deliver services in different ways (e.g. balance between hospital and community services, availability of alternatives to hospitalisation). Third, clinical practice may vary between services (e.g. threshold for admission, discharge planning practices). Each of these factors overlaps to some degree.

To control for the first factor, and allow a proper focus on differences that providers are best able to influence, the service utilisation data was adjusted for differences among catchment areas in terms of their estimated levels of need for inpatient care. This adjustment occurred for those demographic factors known to influence the uptake of specialist mental health services. Age, gender, marital status and socioeconomic disadvantage are known to predict much of the variation in mental health service use. The goal of the analysis was to control for these factors so that the influence of differences in service delivery and clinical practice between AMHS could be assessed independently.

The underlying population structure was estimated for each of the 21 AMHS where each AMHS population was stratified according to 5-year age bands, gender (male or female), marital status (Currently Married / De-Facto vs Not Married = Divorced, Widowed, Separated, Never Married). For each of the 21 AMHS, the population size of each of these strata was estimated using the 1996 Australian Bureau of Statistics Census of Households and Population Data for the adult population aged 15 - 64 years inclusive. In addition, the Index of Relative Socio-Economic Disadvantage (IRSED) from the Socio-Economic Indices for Australia (SEIFA) was estimated for each of the AMHS using the weighted adult population size. Thus, the 'weighted' population approximates that used for funding purposes in Victoria and comprised both measures of population structure and social disadvantage.

Note that although corrections for access to private psychiatry, rurality, homelessness and NESB population are included in the original mental health population-based funding formula, these corrections are not made for these analyses. Each of these variables influences service delivery to some degree, so that controlling for them would have defeated the purpose of the analyses.

The actual rates of service utilisation were then compared to the base population and differences were calculated between the 'observed' (i.e. actual) and the 'expected' (a function of the overall crude state rate and the population characteristics of the AMHS). This difference was expressed as the Standardised Treatment Ratio where values greater than the Statewide average indicate an excess of service utilisation with respect to the measure of interest once age, gender, marital status and levels of social disadvantage were controlled or values less than the statewide average indicate a deficit of service utilisation.

Other Documentation

The review findings and recommendations were further informed by a range of existing documents including Departmental reports and policy documents, interstate and international models of service delivery, relevant research and clinical practice guidelines. (A comprehensive listing of these information sources is included in the *Reference* list)

Appendix 3.1 – Advertisement and Proforma for Submissions

Review of Victoria's Adult Acute Inpatient and Specialist and Statewide Mental Health Services

Call for Submissions

On 19 January 2000, the Minister for Health, the Hon. John Thwaites, announced a review of Victoria's adult acute inpatient and statewide and specialist mental health services.

The aims of these two separate but related reviews are:

Review of adult acute inpatient mental health services

1. To gather and analyse quantitative and qualitative data about existing adult acute inpatient mental health service delivery in Victoria.
2. To identify relevant service provision issues arising from the data collection.
3. To identify options and make recommendations about future Service framework(s) for adult acute inpatient mental health services.
4. To review existing funding mechanisms and issues and make recommendations regarding appropriate funding models to support the identified preferred service framework(s).

Review of Statewide and Specialist mental health services:

1. To gather qualitative and quantitative data about existing models of Specialist and Statewide Mental Health Service delivery in Victoria .
2. To identify relevant service provision issues arising from the data collection within these services and in relation to the broader mental health and other health sectors.
3. To identify future roles and service delivery options for Statewide and Specialist services.
4. To make recommendations about the future structure of Statewide and Specialist service delivery.
5. To review existing funding mechanisms and issues and make recommendations regarding appropriate funding options to support the identified preferred service models.

The Review team is keen to receive written submissions from any interested individuals or organisations. If you wish to make a submission please contact Troy Brickell on Tel: 9616 8087 or email: Troy.Brickell@dhs.vic.gov.au to obtain a proforma. This information can also be accessed via the Department of Human Services website:
http://www.dhs.vic.gov.au/acmh/mh/news_events/whatsnew.htm

Submissions, based on the proforma, should be forwarded by no later than 31 May 2000 to:
Ms Alison Morris
11th Floor
555 Collins Street
MELBOURNE 3000
or email Alison.Morris@dhs.vic.gov.au

SUBMISSION FORMAT

ORGANISATION/ INDIVIDUAL

CONTACT NAME/S

POSITION

CONTACT DETAILS

Address

Email

Phone

Fax

SUMMARY OF SUBMISSION (1/2 PAGE)

(Brief overview of background, issues and recommendations for consideration by review)

YOUR MAIN AREA/S OF INTEREST (EG. ACUTE INPATIENT SERVICES, CONSUMERS, NESB, EATING DISORDERS)

(3 dot points)

YOUR KEY ISSUES OF CONCERN

(3 dot points)

SUBMISSION DETAIL

SOURCES OF INFORMATION

(Key Reports, practice guidelines, publications and other material supporting issues raised)

ATTACHMENTS

Appendix 3.2 – Financial Data Survey

EXPENDITURE ON ADULT INPATIENT AND SPECIALIST STATE-WIDE SERVICES 1998/99 ***For return by 17 May 2000***

1. ORGANISATION: ....

2. CAMPUS (Please provide separate return for each service provider) ....

3. NAME AND CONTACT DETAILS :

....

4. Comment on methodology used and reasons for variation (if any) to data previously submitted to the National Database.

....

....

....

....

5. Expenditure 1998/99 (Accrual Basis)

Please attach separate returns for inpatient services and each State-wide Specialist Service

Cost Type	**Expenditure $**	**EFT**
Nursing Salaries		
- Basic		
- Agency		
- Annual / Sick Leave		
- Overtime		
- Penalties & All'ces		
Total Nursing Salaries		
Medical Salaries		
Allied Health Salaries		
Hotel Staff Salaries		
Admin./ Other Salaries		
Sub-Total Salaries		
Superannuation		
Long Service Leave		
Total Salaries		
Food Supplies		
Medical / Surg. Supplies		
Pharmacy		
Energy		
Hotel Services		
Admin. / Corporate		
Depreciation		
Sub-Total Non Salary		
Total Expenditure		

6. EFT per PAYROLL CLASSIFICATION

Please provide details of EFT for each payroll classification, with sub-totals for each labour category; ie nursing, medical, etc.

7. ECT and AFTER HOURS TRIAGE

Please provide details of costs associated with ECT and after hours triage.

Please return to:
Ms Alison Morris
11/555 Collins Street
Melbourne 3000
Fax: 9616 8726

by COB 17 May 2000

APPENDIX 4 – Glossary of Terms

The following dimensions of quality were developed and agreed upon as part of the National Hospital Outcomes Program 1997 (Commonwealth Department of Health and Family Services). These dimensions have been used in the current Review of Adult Acute Inpatient Mental Health Services and are defined below.

Access:	The capacity of individuals to obtain the same quality of service.
Efficiency:	Maximising benefits (or outcomes) for a given cost.
Appropriateness:	The extent to which potential benefits of an intervention exceed the risks involved.
Effectiveness:	The degree to which an intervention produces measurable increases in survival or improved quality of life (or improved outcomes) when applied in routine practice.
Safety:	The extent to which potential risks were avoided and inadvertent harm minimised in care delivery processes.

APPENDIX 5 – List of Informants

The following individuals and organisations contributed to the Review through the provision of written submissions:

Bennetts, Ms W.
Carers of People with a Mental Illness Network
Central Highlands Division of General Practice Ltd
Community Mental Health Working Group – Shire of Campaspe
Community Psychiatry Wangaratta District Base Hospital
Community Voice on Mental Health
Department of Veterans' Affairs - Vic State Office
Ethnic Mental Health Consultants
Flahive, Ms W.
Gathercole, Ms L.
Gippsland Psychiatric Disability Support Services Forum
Health and Community Services Union
Hedger, Ms D.
Hilltop SFV Carers and Consumers Group
Hopcroft, Mrs M.
Interchurch Chaplaincy Committee of Vic Inc.
Johnstone, Ms J.
Kaleb, Ms K.
Kroschel, Mr J.
Lacey, Mr M.
Lane, Ms J.
Marks, Ms M.
Mental Health Legal Centre
Moore, Mr A.
Murray-Plains Division of General Practice
North East Victoria Division of General Practice
North West Consumer Advisory Group
OT Australia, Victoria
Quayle, Dr J.
Reid, Mr D.
Richmond Fellowship of Victoria, Hume/Loddon Mallee Regions
Royal Australian & New Zealand College of Psychiatrist – Section of Consultation-Liaison Psychaitry
Salvation Army
Schizophrenia Fellowship of Victoria - Gippsland Regional Family Support Program
Schizophrenia Fellowship Victoria
Smith, Ms M.
Snell, Dr A.
Special Needs Access Program
Special Needs Recreation & Arts - City of Port Phillip
Victorian Coalition of Acquired Brain Injury Service Providers
Victorian Mental Illness Awareness Council
West Victoria Division of General Practice

In addition, over 100 people attended a focus group consultation forum on 18 May 2000. Invitees to this forum included:

- Direct service staff
- Consumers
- Consumer and Carer organisations
- DHS Regional Staff
- Representatives of:
    - Psychiatric Disability Support Services
    - Child and Adolescent Mental Health Services
    - Aged Persons Mental Health Services
    - Drug and Alcohol Services
    - Victoria Police
    - Relevant Trade Unions
    - Divisions of General Practice, Victoria
    - Royal Australian and New Zealand College of Psychiatrists
    - Mental Health Review Board
    - Mental Health Legal Centre

An additional consumer consultation session was organised through the Victorian Mental Illness Awareness Council and attended by over 30 consumers.

Royal Commission into
Victoria's Mental Health System

ATTACHMENT RB-12

This is the attachment marked '**RB-12**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

BJPsych | The British Journal of Psychiatry (2017)
211, 350–358. doi: 10.1192/bjp.bp.117.201475

Review article

Remission and recovery from first-episode psychosis in adults: systematic review and meta-analysis of long-term outcome studies[†]

John Lally,* Olesya Ajnakina,* Brendon Stubbs, Michael Cullinane, Kieran C. Murphy, Fiona Gaughran and Robin M. Murray

Background
Remission and recovery rates for people with first-episode psychosis (FEP) remain uncertain.

Aims
To assess pooled prevalence rates of remission and recovery in FEP and to investigate potential moderators.

Method
We conducted a systematic review and meta-analysis to assess pooled prevalence rates of remission and recovery in FEP in longitudinal studies with more than 1 year of follow-up data, and conducted meta-regression analyses to investigate potential moderators.

Results
Seventy-nine studies were included representing 19 072 patients with FEP. The pooled rate of remission among 12 301 individuals with FEP was 58% (60 studies, mean follow-up 5.5 years). Higher remission rates were moderated by studies from more recent years. The pooled prevalence of recovery among 9642 individuals with FEP was 38% (35 studies, mean follow-up 7.2 years). Recovery rates were higher in North America than in other regions.

Conclusions
Remission and recovery rates in FEP may be more favourable than previously thought. We observed stability of recovery rates after the first 2 years, suggesting that a progressive deteriorating course of illness is not typical. Although remission rates have improved over time recovery rates have not, raising questions about the effectiveness of services in achieving improved recovery.

Declaration of interest
None.

Psychotic disorders are marked by heterogeneity in terms of clinical presentation and outcome.[1] Historically, schizophrenia was conceptualised as a chronic, progressively deteriorating condition. However, there is increasing recognition that people with schizophrenia can experience symptomatic improvements and regain a degree of social and occupational functioning.[2] Over the past 20 years there has been an increased focus on specialist early intervention services for first-episode psychosis (FEP).[3,4] However, it remains unclear what the outcomes are for people with FEP (including those with a first episode of schizophrenia) in terms of remission and recovery. To our knowledge, only three systematic reviews and two meta-analyses have considered recovery or remission in FEP and/or schizophrenia.[5–9] The most recent systematic review and meta-analysis concluded that only 13.5% of patients with schizophrenia met the criteria for recovery, although the follow-up period was not given, and this review included people with both first-episode and multi-episode disorder.[9] Patients with multiple episodes include those with more chronic or treatment-resistant illness, who would by definition be expected to have lower recovery rates. A systematic review in FEP identified 'good' outcomes for 42% of patients with psychosis and 31% of those with schizophrenia,[7] whereas a later review of remission in FEP identified an average remission rate of 40% (range 17–78%).[6] These reviews are limited by the wide variety of outcome definitions used,[7] in keeping with a paucity of identified studies using standardised definitions of remission or recovery, the small number of included studies,[6] and the absence of a FEP review including a meta-analysis. Although naturalistic FEP outcome studies of increasing sophistication and duration have been published,[10–13] the longer-term outcomes for these patients in terms of remission and recovery rates remain uncertain. This deficiency in the literature is important, because since the introduction of the Remission in Schizophrenia Working Group (RSWG) criteria for remission in 2005, many studies in FEP have sought to use the operationalised criteria for remission in schizophrenia.[14]

We therefore conducted a systematic review and meta-analysis to assess pooled prevalence rates of remission and recovery in FEP and schizophrenia in longitudinal studies. In addition, we sought to identify potential moderators of remission and recovery. Finally, we sought to investigate whether specific variables have an impact on remission and recovery proportions (e.g. narrow and broad remission and recovery definitions, duration of follow-up, region of study and study year). Our *a priori* hypotheses were the following:

(a) a greater proportion of patients with FEP would meet criteria for remission and recovery in studies from the past 20 years compared with earlier studies;

(b) recovery would be less prevalent in samples with longer duration of follow-up compared with shorter follow-up;

(c) rates of remission and recovery would be lower when defined with narrow criteria.

Method

This systematic review was conducted in accord with the Meta-analysis of Observational Studies in Epidemiology guidelines and the Preferred Reporting Items for Systematic Reviews and Meta-analyses standard.[15,16]

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*Joint first authors.

[†] See editorial, pp. 331–333, this issue.

Inclusion criteria

We included studies of longitudinal observational design (both retrospective and prospective studies) in patients over 16 years old (with no upper age limit) that fulfilled the following criteria.

Remission

Studies reporting remission rates in people with a first psychotic episode (including schizophrenia and affective psychosis) irrespective of clinical setting (in-patient, out-patient or mixed) were included. Remission has been operationalised in terms of symptomatic and/or functional improvement with a duration component. The use of the RSWG criteria has become common over the past decade, measuring both an improvement in symptoms and duration criteria (>6 months) for persistence of mild or absent symptoms.[14] We categorised remission criteria as 'broad' or 'narrow'. Narrow criteria studies were those using the RSWG criteria, comprising two dimensions: symptom severity (mild or absent) and duration (mild or absent symptoms for at least 6 months), or those defining remission as patients being asymptomatic and attaining premorbid functioning sustained for at least 6 months. Broad criteria studies were those that defined symptomatic remission but not duration.

Recovery

Recovery has been operationalised as a multidimensional concept, incorporating symptomatic and functional improvement in social, occupational and educational domains, with a necessary duration component (>2 years).[9,17,18] We mirrored the approach of Jääskeläinen *et al*, categorising those studies in which both clinical and functioning dimensions are operationally assessed, along with a duration of sustained improvement for ⩾2 years.[9] We further analysed recovery in relation to studies in which both clinical and level of functioning dimensions were assessed, but with a duration for sustained improvement of >1 year. We categorised as broad recovery criteria those studies in which either one or none of the symptom improvement and functioning dimensions were used and/or with an insufficient duration criterion.

Treatment contact

Samples were restricted to people with FEP who were making their first treatment contact (in both in-patient and out-patient settings).

Diagnostic system

Only studies using a specified standardised diagnostic system such as ICD versions 8, 9 and 10, DSM-III and -IV, Kraepelin & Feighner's diagnostic criteria, Royal Park Multidiagnostic Instrument for Psychosis and the Research Diagnostic Criteria (RDC) were included.

Other criteria

Study samples were restricted to those that included only individuals with FEP and/or first-episode schizophrenia and/or first-episode affective psychosis. When more than one diagnostic group was identified in a sample, that study was included only if the number in each subgroup was identified. Studies were required to have a follow-up period of at least 12 months, and adequate follow-up data to allow remission or recovery rates to be determined (e.g. studies reporting only the mean difference in symptom rating scales between groups or correlations were excluded). Articles had to be published in a peer-reviewed journal from database inception to July 2016, with no language restriction applied.

Exclusion criteria

We excluded randomised controlled trials, because of the potential for any structured intervention beyond routine care to influence our primary outcomes, as well as studies of organic psychosis.

Search criteria

Two authors (J.L. and O.A.) independently searched PubMed, Medline and Scopus without language restrictions from database inception until 1 July 2016. Key words used were first episode psychosis OR early episode psychosis OR schizophrenia OR schiz* AND remission OR recovery AND outcome OR follow-up. Manual searches were also conducted using the reference lists from recovered articles and recent reviews.[6,7,9]

Data extraction

Two authors (J.L. and O.A.) extracted all data, and any inconsistencies were resolved by consensus or by a third author (B.S.). One author (O.A.) extracted data using a predetermined data extraction form, which was subsequently validated by a second author (J.L.). The data extracted included first author, country, setting, population, study design (e.g. prospective, retrospective), participants included in the study (including mean age, % female), diagnostic classification method, method of assessment (e.g. face-to-face interviews, case records or combination of both approaches), duration of untreated psychosis (DUP), sociodemographic characteristics of the sample (percentage employed, single or in a stable relationship at study entry), baseline psychotic symptoms (mean scores), length of study follow-up, participant loss at follow-up and criteria used to define remission and recovery. When studies reported on overlapping samples, details of the study with the longest follow-up period were included, or if this was unclear, studies with the largest study sample for each respective outcome were included. We included multisite studies, and retained data for the entire cohort and not for individual sites.

Primary outcomes

The primary outcomes were the proportions of people with FEP who met the criteria for remission and recovery respectively over the course of each study as defined above.

Statistical analysis

Owing to the anticipated heterogeneity across studies, we conducted a random effects meta-analysis, in the following sequence. First, we calculated the pooled prevalence rates of remission and recovery in FEP. Second, to account for attrition bias, we imputed a remission and recovery rate using the principle of worst-case scenario, assuming that all people who left the study did not have a favourable outcome. Third, we calculated the subgroup differences in remission and recovery according to whether a narrow or broad definition of remission or recovery was used; the first-episode diagnosis category; the method used to assess remission and recovery (structured face-to-face assessment, structured assessment supplemented with clinical notes and/or interviews with parents; clinical records); duration of follow-up (categorised into three groups: 1–2 years, 2–6 years and >6 years based on ascending duration of follow-up (tertiles); region of study; study period (we selected the midpoint of the study period as the study year, and categorised this by adapting criteria proposed by Warner (recovery studies pre-1975, 1976–1996 and 1997–2016; remission studies pre-1975, 1976–1996, 1997–2004 and 2005–2016);[5] study design; and the setting of the study at first episode (in-patient; community and early intervention services; and mixed in- and out-patient psychiatric services). Fourth, we conducted meta-regression analyses to investigate potential moderators of remission and recovery: age, percentage of men, ethnicity, baseline psychotic symptoms (mean scores), relationship and employment status at first contact, DUP, duration of follow-up, attrition rate and study year. Publication bias was assessed with the funnel plot, Egger's regression test and the trim and fill method.[19,20] Heterogeneity was measured with the *Q* statistic, yielding chi-squared and *P* values, and the I^2 statistic with scores above 50% and 75% indicating moderate and high heterogeneity respectively.[21] Finally, descriptive statistical methods were used for the exploratory summary of study-reported correlates of remission and recovery based on patient-level data not available for study-level meta-regression analyses. All analyses were conducted with Comprehensive Meta-Analysis software version 3 and Stata release 14.

Results

Our search yielded 3021 non-duplicated publications, which were considered at the title and abstract level; 299 full texts were reviewed, of which 79 met inclusion criteria (Fig. 1).[10–13,22–96] Full details of the included studies are given in online Tables DS1 and DS2. There were 44 studies reporting on remission rates and 19 reporting on recovery rates, with 16 studies reporting on both remission and recovery, for a total of 79 independent samples. The final sample comprised 19 072 patients with FEP (range of sample sizes 13–2842); 12 301 (range 13–2210) with remission data and 9642 (range 25–2842) with recovery data.

In the remission sample the mean age of the patients at study recruitment was 26.3 years (median 25.7, range 15.6–42.3) and 40.6% were female. The mean DUP (25 studies) was 433.2 days, s.d. = 238.9, interquartile range (IQR) 265.0–541.4. The mean follow-up period was 5.5 years (60 studies, s.d. = 5.3, IQR = 2.0–7.0). In the recovery sample the mean age of the patients at study recruitment was 27.3 years (median 26.0, range 24.2–28.5) and 41.1% were female. The mean DUP (11 studies) was 359.2 days (s.d. = 215.4, IQR = 226.3–492.8). The mean follow-up period was 7.2 years (35 studies, s.d. = 5.6, IQR = 2.0–10.0).

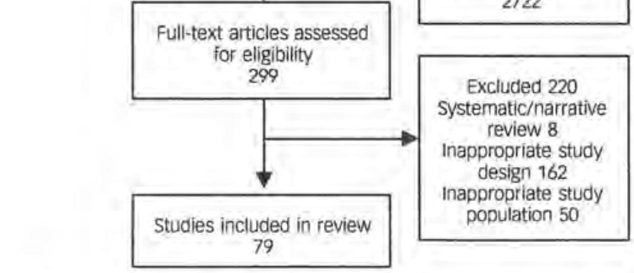

Fig. 1 Study selection process: only 79 studies were eligible for pooling in the meta-analysis.

Remission

The pooled rate of remission among 19 072 individuals with FEP was 57.9% (95% CI 52.7–62.9, $Q = 1536.3$, $P < 0.001$, N = 60) (online Fig. DS1). The Begg–Mazumdar (Kendall's tau $b = 0.151$, $P = 0.09$) and Egger test (bias = 0.98, 95% CI −1.42 to 3.38, $P = 0.47$) indicated no publication bias. A visual inspection of the funnel plot revealed some asymmetry, and we adjusted for this asymmetry and potential missing studies (online Fig. DS2). The trim and fill method demonstrated that the prevalence of remission was unaltered when adjusted for potential missing studies. Restricting the analysis to studies that used the RSWG criteria for remission (25 studies, $n = 6909$), the overall pooled prevalence remission rate was 56.9% (95% CI 48.9–64.5, $Q = 656.9$, 25 studies). Using the worst-case scenario the remission rate was 39.3% (95% CI 35.1–43.5, $Q = 1371$, 55 studies).

Subgroup analyses

Full details of the proportion of people who experienced remission, together with heterogeneity and trim and fill analyses, are summarised in online Table DS3, and a shortened version is given in Table 1. Results of interest are briefly discussed below.

For studies only of patients with schizophrenia the pooled remission rate was 56.0% (95% CI 47.5–64.1, $Q = 378.50$, 25 studies), with an equivalent rate of 55.4% (95% CI 47.7–62.8, $Q = 1049.0$, 29 studies) for patients with FEP; the pooled remission rate was higher in the affective psychosis group (78.7%, 95% CI 63.9–88.5, $Q = 68.6$, 6 studies) compared with the schizophrenia group. There was no difference in remission rates in comparisons of study period, duration of follow-up, study type or setting, or proportion of studies using narrow remission criteria. Remission rates were significantly higher in studies from Africa (73.1%, 95% CI 47.2–89.1, $Q = 2.48$, 2 studies), Asia (66.4%, 95% CI 55.8–75.5, $Q = 139.2$, 2 studies) and North America (65.2%, 95% CI 56.6–72.9, $Q = 192.7$, 17 studies) compared with other regions (including Europe and Australia). In the study period 1976–1996, remission rates in studies from North America (65.5%, 95% CI 50.7–77.9) were significantly higher than in Europe (55.1.1%, 95% CI 35.4–73.2) or Asia (47.1%, 95% CI 38.3–56.0; $P < 0.001$). Equivalent remission rates were identified in the study period 1997–2004 for studies from North America (59.4%, 95% CI 52.7–65.7), Europe (55.9%, 95% CI 48.7–62.9) and Australia (56.1%, 95% CI 30.6–78.7), with significantly higher rates found in studies from Africa (82.1%, 95% CI 63.6–92.3) and Asia (71.5%, 95% CI 55.2–83.7) than in the other regions for this study period ($P = 0.001$). In the most recent study period (2005–2016) studies from North America (70.2%, 95% CI 42.1–88.4), Asia (69.0%, 95% CI 61.9–75.3) and Africa (63.3%, 95% CI 45.1–78.4) had increased remission rates compared with studies in Europe (45.7%, 95% CI 29.5–67.8) although this did not meet statistical significance ($P = 0.09$).

Moderating factors

Full details of the moderators of remission are presented in Table 2. Higher remission rates were associated with studies conducted in more recent years ($\beta = 0.04$, 95% CI 0.01–0.08, $P = 0.018$, $R^2 = 0.10$).

Table 1 Meta-analysis of remission in patients with first-episode psychosis

	No. of studies	Pooled prevalence % (95% CI)	Between-group P
Remission main analysis	60	57.89 (52.68–62.93)	
Remission worst-case scenario	55	39.30 (35.10–43.50)	
Narrow validity			0.721
No	14	54.79 (43.27–65.83)	
Yes	27	56.64 (48.36–64.57)	
Valid by symptomatic remission but not duration	17	63.01 (52.43–72.47)	
Broad validity			0.9112
No	29	56.74 (49.14–64.03)	
Yes	29	58.80 (51.38–65.84)	
Duration criteria for remission			0.414
1–12 weeks	17	62.44 (52.51–71.43)	
3–6 months	27	56.71 (48.86–64.24)	
9 months or longer	2	45.91 (21.57–72.37)	
At final assessment	6	67.38 (50.21–80.88)	
Not stated	6	45.59 (30.05–62.03)	
Remission according to RSWG criteria			0.742
No	35	58.60 (51.78–65.11)	
Yes	25	56.87 (48.93–64.47)	
Study year			0.181
Before 1976	2	29.51 (12.53–55.02)	
1976–1997	18	59.33 (50.08–67.97)	
1997–2004	27	58.66 (51.29–65.67)	
2005–2016	13	58.57 (47.51–68.84)	
Study region			0.002[a]
North America	17	65.19 (56.62–72.88)	
Europe	27	52.71 (46.06–59.26)	
Asia	10	66.35 (55.81–75.48)	
Africa	2	73.07 (47.26–89.15)	
Australia	2	40.29 (20.62–63.66)	

RSWG, Remission in Schizophrenia Working Group.
a. Significant at $P<0.01$.

Recovery

Full details of the proportion of people who recovered, together with heterogeneity and trim and fill analyses, are summarised in online Table DS4 and a shortened version is given in Table 3. The pooled rate of recovery among 9642 individuals with FEP was 37.9% (95% CI 30.0–46.5, $Q=1450.8$, 35 studies, $P=0.006$); see online Fig. DS3. The Begg–Mazumdar test (Kendall's tau $b=-1.0$, $P=0.37$) and Egger test (bias 2.32, 95% CI -1.77 to -6.42, $P=0.25$) indicated no publication bias. A visual inspection of the funnel plot revealed that the plot was largely symmetric (online Fig. DS4). The trim and fill method demonstrated that the prevalence of recovery was unaltered when adjusted for potential missing studies. Assuming the worst-case scenario technique, the pooled prevalence of recovery was 23.3% (95% CI 18.4–29.2, $Q=1270$, 33 studies).

Subgroup analyses

For studies using the narrowest criteria the recovery rate was 25.2% (95% CI 16.87–35.93, $Q=885.45$, 16 studies). Furthermore, the pooled prevalence of recovery was significantly higher in North America (Canada and USA) (71.0%, 95% CI 56.8–82.0, $Q=150.1$, 10 studies, $P<0.001$) than in Europe (21.8%, 95% CI 14.6–31.2, $Q=434.2$, 14 studies), Asia (35.1%, 95% CI 22.1–50.7, $Q=184.5$, 8 studies) and Australia (28.1%, 95% CI 10.0–57.9, $Q=1.45$, 2 studies). In the study period 1976–1996 recovery rates in studies from North America (70.3%, 95% CI 41.3–88.9) were significantly higher than in Europe (29.1%, 95% CI 5.1–75.8) and Asia (22.4%, 95% CI 9.3–44.8%) ($P<0.001$). Similarly, for the most recent study period recovery rates were significantly increased in North America (85.5%, 95% CI 66.7–94.6) compared with Europe (21.2%, 95% CI 14.1–30.6) and Asia (40.6%, 95% CI 25.2–58.2) ($P<0.001$).

Following the trim and fill analysis the recovery rate from North America decreased slightly to 68.5% (95% CI 48.6–83.4); there was a slight increase in the recovery rate seen in studies from Europe to 26.3% (95% CI 16.6–38.9). There was no significant difference in North American studies compared with studies from other regions in relation to attrition rate, average length of follow-up (mean duration North America 4.7 years, s.d. = 4.1, *v.* other regions 7.8 years, s.d. = 5.8; $t=-1.46$, $P=0.15$), or the use of more narrow recovery criteria – although no study in North America used a recovery criterion of more than 2 years' duration, compared with 8 studies from other regions that used this criterion ($\chi^2=2.77$, $P=0.052$). Additionally, studies with follow-up periods longer than 6 years (32.4%, 95% CI 23.4–43.0, $Q=250.5$, 15 studies) or with a 2–6 year follow-up (32.30%, 95% CI 21.5–45.3, $Q=462.0$, 11 studies) had significantly lower recovery rates than studies with a follow-up duration of 1–2 years (54.1%, 95% CI 39.0–68.4, $Q=167.0$, 9 studies) ($P=0.044$).

Equivalent rates of recovery were found in those with FEP (34.4%) and schizophrenia (30.3%) diagnoses. Those with a diagnosis of affective psychosis had a significantly increased pooled recovery rate (84.6%, 95% CI 64.0–94.4, $Q=109.3$, 4 studies) compared with those with FEP (34.4%, 95% CI 25.2–44.9, $Q=527.0$, 19 studies) and schizophrenia (30.3%, 95% CI 19.7–43.6, $Q=514.7$, 12 studies) ($P=0.0031$).

Moderating factors

Full details of the moderators of recovery are presented in online Table DS5. Briefly, the meta-regression analyses showed that

Table 2 Meta-regression of moderators of remission in patients with first-episode psychosis

	Number of comparisons	β	95% CI	P	R^2
Age, years: mean	55	−0.02	−0.07 to 0.02	0.332	0.01
Male, %	57	0.00	−0.02 to 0.02	0.920	0.00
Baseline psychotic symptoms, mean	32	0.00	−0.01 to 0.01	0.464	0.02
DUP					
Mean	9	0.00	−0.01 to 0.01	0.922	0.00
Median	24	0.00	0.00 to 0.00	0.167	0.08
Taking antipsychotic medication, %	16	0.01	−0.01 to 0.02	0.447	0.03
Employed, %	17	−0.02	−0.05 to 0.01	0.125	0.11
Single, %	19	0.02	0.00 to 0.04	0.075	0.11
Ethnicity, %					
White	19	0.00	−0.01 to 0.01	0.952	0.00
Black	15	−0.01	−0.05 to 0.03	0.535	0.01
Asian	12	0.00	−0.01 to 0.02	0.693	0.04
Drop-out, %	49	0.01	−0.01 to 0.02	0.222	0.00
Length of follow-up	57	−0.03	−0.07 to 0.02	0.239	0.02
Study year publication	59	0.04	0.01 to 0.08	0.018	0.10

DUP, duration of untreated psychosis.

Table 3 Meta-analysis results of recovery in patients with first-episode psychosis

	No. of studies	Pooled prevalence % (95% CI)	Between-group P
Recovery main analysis	35	37.90 (30.03–46.45)	
Recovery in worst case	33	23.3 (18.4–29.2)	
Validity criteria			0.001***
Unclear criteria	11	39.52 (25.52–55.47)	
Either clinical or social dimensions assessed	8	65.98 (48.13–80.21)	
Both clinical and social dimensions assessed	16	25.23 (16.87–35.93)	
Duration criterion >1 year			0.018*
No	22	45.99 (35.30–57.05)	
Yes	13	26.39 (16.99–38.57)	
Duration criterion >2 years			0.010**
No	26	44.64 (34.82–54.90)	
Yes	9	22.03 (12.46–35.93)	
Study year			0.041*
Before 1976	1	44.46 (10.76–84.16)	
1976–1997	9	45.15 (29.66–61.63)	
1997–2016	23	32.09 (23.94–41.50)	
Study region			<0.001***
North America	10	71.01 (56.76–82.04)	
Europe	14	21.79 (14.62–31.20)	
Asia	8	35.05 (22.10–50.65)	
Multi-region	1	49.15 (14.21–84.95)	
Australia	2	28.07 (9.99–57.85)	
Follow-up categories			0.044*
1–2 years	9	54.05 (38.95–68.44)	
2–6 years	11	32.26 (21.49–45.31)	
>6 years	15	32.43 (23.36–43.04)	
Study setting			0.004**
Adult psychiatric hospitals	22	48.15 (37.82–58.64)	
Community and early intervention services	4	18.39 (7.90–37.17)	
In-/out-patient psychiatric services	9	24.88 (14.40–39.47)	

*$P<0.5$, **$P<0.01$, ***$P<0.001$.

higher rates of recovery were moderated by White ethnicity (β = 0.02, 95% CI 0.01–0.04, $P = 0.002$, $R^2 = 0.41$), whereas lower rates of recovery were moderated by Asian ethnicity (β = −0.02, 95% CI −0.04 to 0.00, $P = 0.019$, $R^2 = 0.32$) and a higher loss to attrition (or drop-out rate) (β = −0.04, 95% CI −0.07 to −0.01, $P = 0.009$, $R^2 = 0.21$).

Discussion

We found that 58% of patients with FEP met criteria for remission and 38% met criteria for recovery over mean follow-up periods of 5.5 years and 7.2 years respectively. Thirty per cent of those with first-episode schizophrenia met the criteria for recovery. Our findings are particularly relevant given the previously reported lower rate of recovery in multi-episode schizophrenia of 13%.[9] The duration of follow-up adds further weight to the significance of our findings.

Remission

Our findings for remission were remarkably stable and did not differ dependent on the use of more stringent criteria such as the RSWG (57%) or the use of broader criteria (59%). Our remission rate of 57% based on studies using the RSWG criteria is higher than the rate of 40% identified in a systematic review from 2012.[6] Our study improves on this previous review by the inclusion of 25 studies using the RSWG criteria to define remission (compared with 12 studies) and by having a longer average duration of follow-up. Few variables were found to be moderators of remission rates, and no patient-level clinical or demographic variable was associated with remission. We identified that a more recent study period was associated with improved remission rates, perhaps reflecting the improved outcomes from patients with FEP treated in dedicated early intervention services over the past two decades.

Recovery

Our identified rate of recovery of 38% in FEP is higher than previously identified rates of 13.5% and 11–33% in multi-episode schizophrenia.[5,9] Our imputed recovery rate of 23% based on the worst-case scenario technique is equivalent to the recovery rate reported by studies that defined recovery in terms of symptomatic and functional improvement sustained for more than 2 years. Further, this worst-case scenario recovery rate of 23% remains higher than that identified in the most recent review of multi-episode schizophrenia outcomes by Jääskeläinen *et al.*[9] Our pooled recovery rate is similar to the 42% who showed functional recovery in the systematic review of outcome in FEP by Menezes *et al*,[7] although this 'good' outcome was based on data from 11 studies only, whereas we included 39 studies with recovery as an outcome. Further, in the review by Menezes *et al*, the 'good' outcome measure was based on an average follow-up period of 3 years, much shorter than our 7-year follow-up. In our review we reported on studies with standardised definitions of recovery and comparisons between those with strict and broad definitions of recovery – in contrast to the Menezes *et al* review, in which studies reporting on a wide variety of outcome measures (including some with definitions of remission and recovery) were combined into good, intermediate and poor outcomes.[7]

One interesting finding is the significantly increased pooled prevalence of recovery identified in North America (Canada and USA) compared with all other regions. This regional variation in recovery was not accounted for by statistically significant differences in baseline clinical and demographic variables or drop-out rates. We identified that none of the North American studies used the more conservative 2-year criterion to define recovery, compared with eight (32%) studies from other regions, and only one (11%) North American study had a follow-up duration longer than 6 years, compared with 52% (13 studies) from other regions – differences that trended towards significance and potentially affected the improved recovery rate from this region. This finding warrants further investigation. It may be related to differences in the types of patients with FEP who were enrolled in North America compared with other regions. There may be other service-level confounds that we were unable to investigate, such as a greater proportion of studies in North America occurring in academic centres, in which more intensive and multimodal treatment approaches might have been available. However, we were unable to assess the effects of regional treatment variations that might have contributed to improved recovery rates in North America. Further, the influence of potentially non-representative sampling in this region could not be accounted for.[97] However, the recovery rates for studies from North America remained higher than those reported from other regions across the study periods, suggesting that the findings may not be related to health service developments.

We demonstrated for the first time in a large-scale meta-analysis that recovery in FEP is not reduced with a longer duration of follow-up. This finding, contrary to one of our hypotheses, was interesting in that those with a follow-up period greater than 6 years (32% recovery rate) and those with a 2–6 year follow-up (32% recovery rate) had equivalent rates of recovery, indicating that the rate of recovery seen from 2–6 years can be maintained for patients followed up beyond 6 years. This is in contrast to previous reviews that found an association between longer follow-up duration and reductions in 'good' outcomes.[7,8] If psychotic disorders (more specifically schizophrenia) are progressive disorders, then we might expect to see decreased recovery rates with longer periods of follow-up. The fact that we have not identified any changes in recovery rates after the first 2 years of follow-up indicates an absence of progressive deterioration. This suggests that patients with worse outcomes are apparent in the earlier stages of illness, rather than that the course of illness is progressive for the majority of patients.[98] This is supported by recent evidence indicating that treatment resistance in schizophrenia is present from illness onset for the majority of those who develop a treatment-resistant course of illness.[99]

We predicted that a greater proportion of patients with FEP would have recovered in recent years. However, as in earlier reviews in multi-episode patient samples (and in contrast to our findings in relation to remission rates), we did not identify that recovery rates were increasing over time.[5,8,9] In fact, we identified a significantly reduced pooled recovery rate for studies conducted between 1997 and 2016 (32%) compared with the pooled recovery rate of 45% for studies conducted from 1976 to 1996. This finding in a FEP population indicates that thus far the dedicated and intensive specialist care provided for patients with FEP over the past two decades has not resulted in improved recovery rates, even though remission rates improved over the same period. Knowledge of factors associated with increased recovery in FEP can help identify individuals in need of more robust interventions. However, we found few moderators of recovery in our meta-analysis. White ethnicity was associated with increased recovery, whereas Asian ethnicity was associated with lower recovery rates. Higher drop-out rates moderated lower recovery, potentially indicative of a selection bias, in that those who are well and are no longer in contact with mental health services may be disproportionately lost to follow-up, thus affecting the recovery rate.

Duration of untreated psychosis

A longer DUP was not a moderator of remission or recovery rates. This was a secondary outcome measure in our study, but despite that, our findings are contrary to previous meta-analyses, which found that a shorter duration is associated with better outcomes.[100] Although this finding is unexpected, it is important to highlight that we did not design our study to identify all FEP studies that have investigated DUP in relation to outcomes. Further, we did not screen studies for inclusion based on definitions of DUP, potentially introducing methodological variation, and confounding the finding. It may also be probable that patients with a longer DUP might be more likely to be lost to follow-up, something that we did not control for. However, we included nine remission studies reporting on associations between mean duration of DUP and remission, similar to the ten studies included in a 2014 systematic review and meta-correlation analysis which identified a weak negative correlation between longer mean DUP and remission.[101]

Strengths and limitations

There was considerable methodological heterogeneity across studies. Consequently, we encountered high levels of statistical heterogeneity, which is to be expected when meta-analysing observational data.[15] We followed best practice in conducting subgroup and meta-regression analyses to explore potential sources of heterogeneity. However, the main results do not appear to be influenced by publication bias, and were largely unaltered after applying the trim and fill method. Further, for remission there was little variability in the overall rates of remission categorised by definition of remission, study type and method of assessment used. Although the different definitions of recovery can provide an inflated rate for this outcome, we provided data relating to studies with the most stringent criteria for recovery with symptomatic and functional recovery for more than 2 years (with an identified recovery rate of 22%). We further provided a worst-case scenario rate for remission and recovery, imputing these values based on the trial number of recruited patients, and assuming that all those lost to follow-up would not have met criteria for remission or recovery. Our findings therefore offer valid measures of remission and recovery in FEP. A second limitation is the inadequate data on important confounders such as treatments given over the course of follow-up, adherence to treatment, social functioning and symptom profile over the course of follow-up, and lifestyle factors such as alcohol and substance use, precluding the meta-analytic assessment of these factors as moderating or mediating variables. Future studies might wish to consider including data from intervention studies in FEP, to assess the influence of specific treatments and adherence to treatment on remission and recovery rates.[102] Third, data for this meta-analysis were extracted from baseline and follow-up points from the individual studies, with limited information available in individual studies for the period during the follow-up. Fourth, although remission and recovery rates were provided at study end-point, no information was available on those who met – and sustained – criteria for remission or recovery for the entire duration of follow-up, nor at what time point individuals met criteria for remission or recovery. The absence of such data does not allow for a more detailed description of illness trajectory. However, we have been able to delineate the effects of duration of study follow-up on remission and recovery. Fifth, although we identified studies from six regions of the world, there was marked variability in the number of studies from each region, with the majority of studies conducted in North America and Europe. In relation to the higher rate of recovery identified in North America compared with other regions, we cannot rule out confounding variables relating to differences in the types of patients with FEP who were enrolled in North America compared with other regions, and other service-level confounds that might have existed between regions. However, our finding of lower remission rates in Europe is consistent with findings from the prospective Worldwide Schizophrenia Outpatient Health Outcomes study on the outcome for multi-episode schizophrenia in an out-patient setting.[103]

Finally, consideration of sampling bias due to variability at the point of recruitment is required. Some patients might recover quickly from an episode and not wish to participate, others might be severely unwell and unable to consent to participate, and community-based FEP studies might be unable to recruit patients with more chaotic presentations.

Clinical implications

This is the first meta-analysis of remission and recovery rates, and moderators of these outcomes, in people with FEP, and the first meta-analysis pooling and comparing all available data across patients with FEP, first-episode schizophrenia and first-episode affective psychosis. We provide evidence of higher than expected rates of remission and recovery in FEP. We confirm that recovery rates stabilise after the first 2 years of illness, suggesting that psychosis is not a progressively deteriorating illness state. Although remission rates have improved over time rates of recovery have not done so, potentially indicating that specialised FEP services in their current incarnation have not provided improved longer-term recovery rates. Our study highlights a better long-term prognosis in FEP and first-episode schizophrenia, and a more positive outlook for people diagnosed with these conditions, than has been suggested by previous studies, which included patients with multi-episode schizophrenia.

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EXTRA CONTENT ONLINE

Royal Commission into
Victoria's Mental Health System

ATTACHMENT RB-13

This is the attachment marked '**RB-13**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

Paediatric mental and physical health presentations to emergency departments, Victoria, 2008–15

Harriet Hiscock[1], Rachel J Neely[2], Shaoke Lei[1,2], Gary Freed[3]

The known Mental health disorders in children and adolescents are common, but their impact on presentations to emergency departments (EDs) is unknown.

The new From 2008–09 to 2014–15, mental health presentations increased by 6.5% per year. Rates of presentation with self-harm or stress-related, mood, and behavioural and emotional disorders increased markedly. The burden on ED resources by presentation was greater for mental health than for physical health presentations.

The implications The number of children presenting to EDs with mental health problems is rising. The reasons should be determined so that mental health care for young people can be improved.

Abstract

Objectives: To identify trends in presentations to Victorian emergency departments (EDs) by children and adolescents for mental and physical health problems; to determine patient characteristics associated with these presentations; to assess the relative clinical burdens of mental and physical health presentations.

Design: Secondary analysis of Victorian Emergency Minimum Dataset (VEMD) data.

Participants, setting: Children and young people, 0–19 years, who presented to public EDs in Victoria, 2008–09 to 2014–15.

Main outcome measures: Absolute numbers and proportions of mental and physical health presentations; types of mental health diagnoses; patient and clinical characteristics associated with mental and physical health presentations.

Results: Between 2008–09 and 2014–15, the number of mental health presentations increased by 6.5% per year, that of physical health presentations by 2.1% per year; the proportion of mental health presentations rose from 1.7% to 2.2%. Self-harm accounted for 22.5% of mental health presentations (11 770 presentations) and psychoactive substance use for 22.3% (11 694 presentations); stress-related, mood, and behavioural and emotional disorders together accounted for 40.3% (21 127 presentations). The rates of presentations for self-harm, stress-related, mood, and behavioural and emotional disorders each increased markedly over the study period. Patients presenting with mental health problems were more likely than those with physical health problems to be triaged as urgent (2014–15: 66% v 40%), present outside business hours (36% v 20%), stay longer in the ED (65% v 82% met the National Emergency Access Target), and be admitted to hospital (24% v 18%).

Conclusions: The number of children who presented to Victorian public hospital EDs for mental health problems increased during 2008–2015, particularly for self-harm, depression, and behavioural disorders.

Mental health and substance use disorders are the leading cause of disability in children and young adults worldwide.[1] Over a 12 month period, 14% of 4–17-year-olds in Australia — 580 000 children and adolescents — are experiencing mental health problems.[2] Mental health disorders during childhood have adverse effects throughout life,[3,4] and the onset of 50% of all mental disorders occurs before the age of 14 years.[5]

Australian children receive mental health care from a variety of community-based organisations,[6] but it has been anecdotally reported that an increasing number of children and young people are presenting to emergency departments (EDs) with mental health problems. This is worrying; while EDs are equipped to help children who self-harm or take drug overdoses, they are typically noisy, stimulating environments, not conducive to calming agitated patients.[7] Further, patients who require mental health care can disturb the routine and flow of the ED, and can place a greater demand on resources than medical or trauma patients.[7] Specialised screening tools and mental health consultants trained in paediatric medicine can reduce the likelihood of hospitalisation and the length of stay in the ED, and also ease security problems,[8] but they are not available in all EDs.[8,9]

Two Australian studies have assessed presentations to EDs by children for mental health problems; both were undertaken more than ten years ago and were single site, cross-sectional studies in tertiary level paediatric EDs. An audit during 2002–03 found that children with psychological emergencies accounted for 0.5% of all presentations over a 10-month period, and that they were more likely to be admitted to hospital than other ED patients.[10] A retrospective review in another ED over the same period identified 203 adolescents aged 12–18 years with mental health problems, 47% of whom were admitted to hospital.[11] A national study in the United States found that the number of ED visits for mental health problems by children aged 10–14 years increased by 21% during 2006–2011, with a 34% increase for substance-related disorders and a 71% rise for impulse control disorders.[12]

Mental health problems may place a greater burden on EDs than physical health presentations in terms of triage category, length of stay, proportion meeting the National Emergency Access Target (NEAT) of being admitted or discharged within 4 hours,[13] and admission rates. A multi-site study in the US found that paediatric patients with mental health problems were up to three times more likely to be admitted to hospital than patients of the same age with physical problems,[14] while another multi-site study found that they were more likely to stay in the ED longer.[15]

The questions of whether mental health presentations are increasing in number and pose a greater burden than physical

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Podcast with Harriet Hiscock available at https://www.mja.com.au/podcasts

health presentations have important policy, service delivery, and workforce training implications. We therefore aimed to document the numbers and proportions of presentations to EDs in Victoria during a 7-year period by patients aged 19 years or younger for mental and physical health problems; the types of mental health diagnoses they received; patient characteristics associated with mental and physical health presentations; and the relative clinical burdens of mental and physical health presentations, including triage category, length of stay, time of presentation, and disposal patterns.

Methods

Data were obtained from the Victorian Emergency Minimum Dataset[16] (VEMD) for the financial years 2008–09 to 2014–15. The VEMD is a standardised state dataset comprising de-identified demographic, administrative, and clinical data for presentations to Victorian public hospitals with 24-hour EDs. However, diagnostic codes are usually entered by clinicians who have limited training in coding, which can compromise the diagnostic accuracy of the dataset.[17]

Variables obtained from the VEMD included presentation data (eg, length of stay), departure status (eg, admission), demographic data (eg, age, sex), and diagnosis (full list: online Appendix). Data were collected for children and adolescents aged 0–19 years who presented to general or children's hospitals; it was assumed that young people with mental health problems would not have visited specialty hospitals (eg, maternity hospitals). Hospital campus data were coded by VEMD as metropolitan or rural in a manner that prevented identification of individual patients.

Statistical analyses

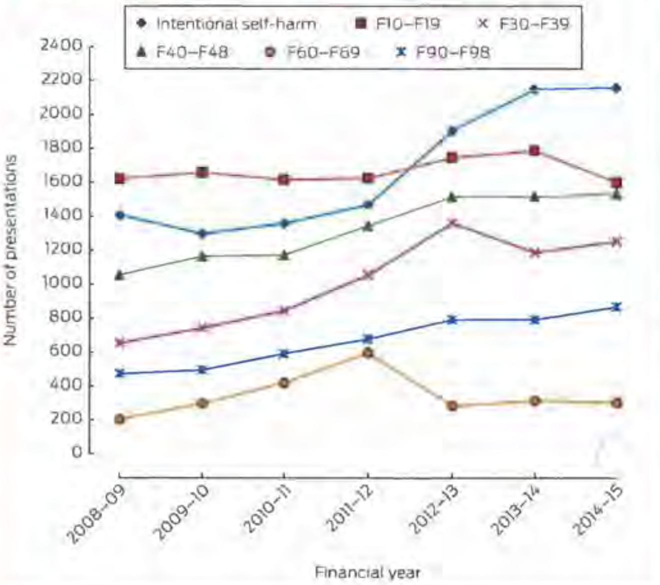
We calculated the absolute number of mental and physical health presentations by children and adolescents to Victorian EDs for each 12-month period. As it was possible that shifts in the age and sex distributions of the general population contributed to changes in ED presentation numbers, we examined annual trends in population growth for Victoria, by VEMD age band and sex, using Australian Bureau of Statistics data for the 7 years assessed.[18]

Mental health presentations were defined as those leading to an F group diagnosis (F00–F99, Mental and behavioural disorders) according to the International Classification of Diseases, revision 10, Australian modification[19] (ICD-10-AM) or a diagnosis of intentional self-harm. As there is no ICD-10-AM diagnostic code for self-harm, we identified these cases by a primary diagnosis of any physical injury together with coding of human intent equal to intentional self-harm. Differences in the numbers of mental and physical health presentations between the first and last years of the study period were expressed as percentages.

We transformed the Statistical Local Area score in the VEMD to a quintile on the Socio-Economic Index for Areas (SEIFA) — Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD).[20] The IRSAD is an index of economic and social conditions of people and households in an area, based on census data; a lower score corresponds to greater disadvantage.[21]

We compared patient and presentation characteristics associated with mental and physical health presentations for each financial year. The independence of categorical variables was assessed in χ^2 tests. All data were analysed in R 3.3.2 (R Foundation for Statistical Computing).

1 Presentations to Victorian emergency departments by people aged 0–19 years for mental health problems, 2008–09 to 2014–15: the most frequent mental health diagnoses, by ICD-10-AM broad category code



ICD-10-AM = International Classification of Diseases, revision 10, Australian modification. Broad category codes: psychoactive substance use-related (F10–F19), mood disorders (F30–F39), stress- and anxiety-related (F40–F48) adult personality disorders (F60–F69), and behavioural and emotional disorders (F90–F98). ◆

Ethics approval

The study was screened and approved by the Royal Children's Hospital Human Research Ethics Committee, and was exempted from formal ethics approval. The study was also approved by the Department of Health and Human Services as custodians of the VEMD data.

Results

Over the 7 years, there were 2 763 139 presentations to E in Victoria by children aged 0–19 years. We excluded 216 372 records because they did not include a primary diagnosis; 2 546 767 presentations were analysed, of which 52 359 (2.1%) were for mental health problems and 2 494 408 (97.9%) for physical health problems.

The annual number of mental health presentations increased by 46%, from 5988 in 2008–09 to 8726 in 2014–15 (average annual increase, 6.5%). The annual number of physical health presentations grew by 13%, from 336 546 to 381 667 (average annual increase, 2.1%). The proportion of mental health presentations rose from 1.7% in 2008–09 to 2.2% in 2014–15.

Mental health diagnoses

During the 7-year period, 11 770 presentations (22.5% of all mental health presentations) were for intentional self-harm. The number of presentations for intentional self-harm increased by 52.8%, from 1412 in 2008–09 to 2157 in 2014–15, becoming the most frequent mental health-related reason for presentation (Box 1).

Mental health problems related to psychoactive substance use (ICD-10-AM codes F10–F19) comprised the second largest category of presentation (11 694 presentations, 22.3%). Stress and anxiety (ICD-10-AM codes F40–F48), mood disorders (F30–F39), 2 Characteristics of people aged 0–19 years who presented to Victorian emergency departments, 2008–09 to 2014–15, for mental or physical health problems

	2008–09			2010–11			2012–13			2014–15		
Outcome	Mental	Physical	P	Mental	Physical	P	Mental	Physical	P	Mental	Physical	P
Presentations (proportion of all presentations)	5988 (1.7%)	336 546 (98.3%)		6622 (1.9%)	347 508 (98.1%)		8503 (2.3%)	355 722 (97.7%)		8726 (2.2%)	381 667 (97.8%)	
Hospital campus (proportion of all presentations)			0.14			< 0.001			< 0.001			0.004
Metropolitan	4048 (1.8%)	224 465 (98.2%)		4602 (2.0%)	230 625 (98.0%)		5935 (2.4%)	239 199 (97.6%)		6239 (2.3%)	267 386 (97.7%)	
Rural	1940 (1.7%)	112 081 (98.3%)		2020 (1.7%)	116 883 (98.3%)		2568 (2.2%)	116 523 (97.8%)		2487 (2.1%)	114 281 (97.9%)	
Age band (years)			< 0.001			< 0.001			< 0.001			< 0.001
0–4	162 (2.7%)	138 271 (41.1%)		165 (2.5%)	144 119 (41.5%)		138 (1.6%)	148 847 (41.8%)		143 (1.6%)	163 966 (43.0%)	
5–9	164 (2.7%)	60 958 (18.1%)		171 (2.6%)	63 461 (18.3%)		200 (2.4%)	66 221 (18.6%)		257 (2.9%)	74 696 (19.6%)	
10–14	888 (14.8%)	60 662 (18.0%)		1038 (15.7%)	60 674 (17.5%)		1463 (17.2%)	61 589 (17.3%)		1617 (18.5%)	65 528 (17.2%)	
15–19	4774 (79.7%)	76 655 (22.8%)		5248 (79.3%)	79 254 (22.8%)		6702 (78.8%)	79 065 (22.2%)		6709 (76.9%)	77 477 (20.3%)	
Sex (boys)	2285 (38.2%)	188 427 (56.0%)		2679 (40.5%)	192 815 (55.5%)		2971 (34.9%)	195 591 (55.0%)		3008 (34.5%)	210 042 (55.0%)	
IRSAD quintile, median (IQR)	2 (2–4)	2 (2–4)		3 (2–4)	2 (2–4)		3 (2–4)	2 (2–4)		3 (2–4)	3 (2–4)	
Presentation time			< 0.001			< 0.001			< 0.001			< 0.001
08:00–18:00 (in-hours)	2060 (34.4%)	186 392 (55.4%)		2316 (35.0%)	193 128 (55.6%)		3202 (37.7%)	196 384 (55.2%)		3468 (39.7%)	208 241 (54.6%)	
18:00–22:00 (after hours)	1431 (23.9%)	83 489 (24.8%)		1574 (23.8%)	85 291 (24.5%)		2019 (23.7%)	89 782 (25.2%)		2150 (24.6%)	97 296 (25.5%)	
22:00–02:00 (midnight)	1660 (27.7%)	41 630 (12.4%)		1814 (27.4%)	42 928 (12.4%)		2261 (26.6%)	43 260 (12.2%)		2167 (24.8%)	47 794 (12.5%)	
02:00–08:00 (early morning)	837 (14.0%)	25 035 (7.4%)		918 (13.9%)	26 161 (7.5%)		1021 (12.0%)	26 296 (7.4%)		941 (10.8%)	28 336 (7.4%)	
Triage category			< 0.001			< 0.001			< 0.001			< 0.001
1–3 (potentially to immediately life-threatening)	3651 (61.0%)	113 851 (33.8%)		4086 (61.7%)	124 756 (35.9%)		5444 (64.0%)	132 514 (37.3%)		5788 (66.3%)	151 642 (39.7%)	
4 (potentially serious) or (less urgent)	2337 (39.0%)	222 695 (66.2%)		2536 (38.3%)	222 752 (64.1%)		3059 (36.0%)	223 208 (62.7%)		2938 (33.7%)	230 025 (60.3%)	
Time to treatment (min), median (IQR)	14 (4–38)	24 (8–60)		18 (6–48)	25 (9–62)		19 (7–47)	24 (9–59)		17 (6–39)	21 (9–51)	
Length of stay (h)			< 0.001			< 0.001			< 0.001			< 0.001
< 4	3698 (61.8%)	269 350 (80.0%)		3875 (58.5%)	268 725 (77.3%)		5055 (59.4%)	278 188 (78.2%)		5706 (65.4%)	314 585 (82.4%)	
4–11	1959 (32.7%)	64 060 (19.0%)		2384 (36.0%)	74 188 (21.3%)		2999 (35.3%)	72 991 (20.5%)		2623 (30.1%)	63 069 (16.5%)	
12–23	321 (5.4%)	3089 (0.9%)		360 (5.4%)	4550 (1.3%)		443 (5.2%)	4524 (1.3%)		390 (4.5%)	4005 (1.0%)	
> 24	10 (0.2%)	47 (< 0.1%)		3 (< 0.1%)	45 (< 0.1%)		6 (0.1%)	19 (< 0.1%)		7 (0.1%)	8 (< 0.1%)	
Departure status			< 0.001			< 0.001			< 0.001			< 0.001
Return to usual residence	4688 (78.3%)	287 256 (85.4%)		5108 (77.1%)	291 146 (83.8%)		6378 (75)	292 288 (82.2%)		6199 (71.0%)	301 681 (79.0%)	
Ward at this hospital	984 (16.4%)	42 842 (12.7%)		1109 (16.7%)	47 356 (13.6%)		1590 (18.7%)	53 699 (15.1%)		2055 (23.6%)	70 614 (18.5%)	
Transfer to another hospital	208 (3.5%)	4115 (1.2%)		255 (3.9%)	4745 (1.4%)		384 (4.5%)	4865 (1.4%)		315 (3.6%)	4390 (1.2%)	
Departure before treatment complete	108 (1.8%)	2333 (0.7%)		147 (2.2%)	3853 (1.1%)		144 (1.7%)	4350 (1.2%)		153 (1.8%)	4447 (1.2%)	

IRSAD = Index of Relative Socio-Economic Advantage and Disadvantage; IQR = interquartile range. Data are shown for only every second financial year for reasons of space. All percentages are column proportions, except rows for "Presentations" and "Hospital campus". ◆

3 Population rates of presentations to Victorian emergency departments by people aged 0–19 years with mental health problems, 2008–2015*

ICD-10-AM diagnostic category	Presentations per 10 000 people aged 0–19 years						
	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15
Intentional self-harm†	11	10	10	11	14	15	15
F10–F19 (Psychoactive substance use)	12	12	12	12	13	13	11
F40–F48 (Neurotic, stress-related)	8	9	9	10	11	11	11
F30–F39 (Mood)	5	6	6	8	10	8	9
F90–F98 (Behavioural/emotional)	4	4	4	5	6	6	6
F60–F69 (Adult personality disorders)	2	2	3	4	2	2	2

ICD-10-AM = International Classification of Diseases, revision 10, Australian modification. * Based on number of people in Victoria aged 0–19 years for each financial year.[18]
† No ICD-10-AM diagnostic category. ◆

and behavioural and emotional disorders (F90–F98) together accounted for 21 127 presentations (40.3% of mental health presentations). The annual number of presentations for neurotic and stress-related disorders (mainly anxiety) increased by 46.1% during the 7-year period (from 1054 to 1540), for behavioural and emotional disorders (mainly conduct disorder) by 83.1% (from 473 to 866), and for mood disorders (mainly depression) by 91.3% (658 to 1259) (Box 1).

Patient characteristics associated with mental and physical health presentations during 2014–15

In 2014–15, 6709 mental health presentations were by 15–19-year-olds (76.9% of all mental presentations by people aged 0–19 years), and 1617 (18.5%) by 10–14-year-olds. Since 2008–09, the proportion of presentations by 15–19-year-olds for mental health problems had decreased (from 79.7%) while the proportion for 10–14-year-olds had increased (from 14.8%). Most mental health presentations during 2014–15 were by girls (5718, 65.5%), whereas fewer than half of all physical health presentations were by girls (171 625, 45.0%) (Box 2).

The largest proportion of physical health presentations was for children aged 0–4 years (163 966, 43.0% of physical health presentations).

Over the 7-year period, the number of children aged 0–9 years in Victoria increased, but there was only a negligible increase in the older age groups in which the number of mental health presentations had increased (data not shown). The numbers of girls and boys in Victoria each increased by 1.07% per annum over the 7 years, but the proportion of boys who presented to an emergency department with a mental health problem decreased while that of girls increased (Box 2); further, the presentation rates for self-harm, stress-related, mood, and behavioural and emotional disorders each increased markedly over the study period (Box 3).

The proportions of mental and physical health presentations to rural and metropolitan EDs were similar, nor were they influenced by socio-economic status of residence (Box 2). The median time to treatment was slightly lower for children with mental health problems (17 min; interquartile range [IQR], 6–39 min) than for those presenting with physical health problems (21 min; IQR, 9–51 min).

Relative burden of mental and physical health presentations during 2014–15

A greater proportion of mental health presentations (5788 presentations, 66.3%) than of physical health presentations (151 642, 39.7%) were triaged as urgent (triage categories 1–3), and a greater proportion took place after hours (10 pm–2 am: 2167, 24.8% *v* 47 794, 12.5%; 2 am–8 am: 941, 10.8%; 28 336, 7.4%). Fewer mental than physical health presentations met the NEAT target (5706, 65.4% *v* 314 585, 82.4%). Children presenting for a mental health problem were more likely to be admitted to hospital than those with physical health problems (2055, 23.6% *v* 70 614, 18.5%). Similar patterns applied in other years (Box 2).

Discussion

This is the first Australian study to investigate trends in presentations to EDs by children and young adults for mental health problems. The number of children who presented to Victorian public EDs increased between 2008–09 and 2014–15; the number of mental health presentations increased by 46%, that of physical health presentations by 13%. Intentional self-harm and psychoactive substance use were the most frequent reasons for mental health presentations. Stress-related, mood, and behavioural and emotional disorders together accounted for 40% of mental health presentations, and the numbers of presentations for each of these reasons increased rapidly during the 7-year study period. Children who presented with mental health problems were more likely to be triaged as urgent, to present after business hours, to stay longer in the ED, and to be admitted to hospital than those who presented with physical health problems.

Our findings are similar to results reported in the USA, where the number and proportion of mental health visits to EDs by children aged 10–14 years, including those associated with substance use, increased by 21% between 2006 and 2011.[12] Earlier studies also found that mental health presentations by children were associated with longer ED stays[15] and an increased likelihood of admission to hospital.[10,14] In contrast to American studies,[14] we found that the number of ED presentations for mood and stress-related disorders, particularly depression and anxiety, rose rapidly. Data from two surveys indicated that the prevalence of major depression in Australia among 4–17-year-olds increased from 2.1% in 1998 to 3.2% in 2013–14,[22] but this does not explain the steep rise in presentations to the ED for mood disorders during our study period. We also found that mental health presentations by children aged 10–14 years comprised an increasing proportion of all presentations by children and adolescents, suggesting that community-based care for these children is inadequate.

Our study had several strengths. While other authors have reported the increasing number of children presenting to Victorian EDs,[23,24] our data extend this work by differentiating between trends in the relative proportions and burdens of mental and physical health presentations. While there were some changes to ICD-10-AM coding during the study period, their impact would have been minimal; we examined broad diagnostic categories rather than individual diagnoses, and commenced analyses during the 2008–09 financial year, when diagnoses related to depression became available. Coding of diagnoses in VEMD data are not independently verified by third party assessors, but their integrity is regularly assessed by an external advisory group.

Our study was limited by the quality of the VEMD data, particularly by inaccuracies in diagnostic coding, as codes are generally entered by busy clinicians with limited training in coding.[17] Data on presentations to private EDs (around 20% of Victorian EDs that receive children[25]) were not available because private EDs are not required to supply data to the VEMD. In addition, we could not compare the characteristics of presentations to community and paediatric hospitals, as hospital campus coding was applied in the dataset. Investigating these differences is important, as presentation characteristics, hospital resources, and management of paediatric mental health presentations may differ between the two hospital types. Further, the VEMD captures only one diagnosis per presentation, as a result of which some physical health presentations (eg, abdominal pain) by patients with underlying mental health problems (eg, anxiety) were probably excluded from the mental health presentation category. Finally, although attention deficit/hyperactivity disorder is the most common mental health diagnosis in Australian young people,[2] the VEMD does not include an ICD-10-AM code for this diagnosis.

Mental health disorders in children and adolescents account for an increasing number of presentations to EDs, with particularly large increases in the numbers of presentations for depression and behavioural problems. In the 2013–14 Australian Child and Adolescent Survey of Mental Health and Wellbeing (completed by 6310 caregivers of children aged 4–17 years, 13.9% of whom were assessed as having had a mental disorder during the previous 12 months), 39.6% of those who did not seek help for their children's mental health problems did not know where to obtain help, while 36.4% were uncertain whether assistance was necessary.[22] General practitioners were the most common source of professional help, but they typically referred children to specialist services that often involved out-of-pocket costs that caregivers could not afford. All these factors may delay treatment, resulting in crisis presentations to EDs.

Potential solutions include public health campaigns to improve recognition by caregivers of the symptoms of mental health problems in children and awareness of where to seek help. Providing GPs with skills and financial resources for managing social, emotional and behavioural problems during early childhood is also important. While Headspace provides mental health services for those aged 12–25 years, our data suggest that younger children need more help. Hubs of care for younger children should include clinicians who offer not only co-located services, but also outreach support to the community and schools to share their expertise and, ultimately, to reduce the number of children who present to EDs with mental health problems.

Competing interests: No relevant disclosures.

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ATTACHMENT RB-14

This is the attachment marked '**RB-14**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

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ORIGINAL RESEARCH

Management of mental health patients in Victorian emergency departments: A 10 year follow-up study

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Abstract

Objectives: Despite efforts to restructure mental health (MH) services across Victoria, the social and economic burden of MH illness continues to grow. This study compares MH presentations to EDs with a study undertaken 10 years earlier.

Methods: The article is a retrospective observational study of MH presentations to four Victorian EDs between May and October 2013. Subjects were included if the presentation was MH related as determined by an International Classification of Diseases (version 10) discharge diagnosis, they were referred to an emergency crisis assessment team or had a documented presenting psychiatric complaint. Variables were extracted from electronic medical records and compared with 2004 data from a previous published study.

Results: There were 5659 MH presentations over the 5 months compared with 2788 in 2004. The median ED length of stay decreased from 4:18 h in 2004 to 3:20 h in 2013 ($P < 0.001$), with a significant reduction in length of stay >4 h from 52.5% to 35.4% ($P < 0.001$). There was a 22-fold increase in short stay units as discharge destination from 0.9% to 20.2% ($P < 0.001$). Patients presenting with concurrent methamphetamine exposure doubled from 2.2% of presentations to 4.3% ($P < 0.001$).

Conclusion: Despite increasing MH-related presentations, changes in ED practice have allowed improvements in delivery of care through a shortened ED length of stay and the virtual elimination of very long stays over 24 h. However, there continues to be significant variability in management and performance across hospital sites. Identifying which interventions lead to standout site performance, and subsequent application more broadly, may improve future ED delivery of care.

Key words: *emergency department length of stay, emergency department performance, emergency medicine, emergency psychiatric services, mental health.*

Key findings

- Over the last decade, the time spent in emergency being treated and waiting for a bed has fallen substantially.
- New models of care, including the use of short stay units, are at least partially responsible for the improved care although considerable variation across sites exists.
- The increasing use of amphetamines in this population may warrant new approaches to acute mental health management.

Introduction

Despite efforts in recent decades to restructure mental health (MH) services across Victoria by shifting resources away from institutionalised care and towards community-based programmes, MH illness remains a great social and economic burden.[1] The high prevalence of MH illness, coupled with limited resources, ensures services to operate at full capacity, which are unable to meet demand.[2,3] The resulting overflow of acute MH crisis situations is thereby shifted to hospitals and, more specifically, the ED.

Over recent years, EDs have been struggling to deal with increasing total presentations and are unable to meet state-established performance goals.[4,5] In the past 10 years, Victorian population growth has led to ED presentations increasing by 7% yearly, reaching 1 530 000 presentations statewide in 2012; the number of MH presentations is expected to have increased proportionally.[6] Care of MH patients in the ED is particularly challenging, often requiring more resources and specialised care than non-MH patients.[7] Evaluation of the 4 h target implemented in the UK's National Health Service showed that MH patients were disproportionately represented in presentations where disposition was delayed for over 4 h.[8] This may also be true in Victoria.

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Evaluation of MH presentations to Victorian EDs should provide valuable data on obstacles to delivery of care, an essential requirement if Victoria is to improve patient care while meeting performance goals.

Knott *et al.* (2007) evaluated the demographics, presentation, management and disposition of MH patients in Victorian EDs and provided a comprehensive picture of the MH burden to EDs over the 2004 study period.[9] This analysis found that EDs were being increasingly used as initial points of care for acute MH presentations. The study observed significant variability in MH patient management among hospitals despite a similar burden of patients presenting to each site. These findings may indicate localised deficiencies in systems or resource availability across sites.

This 10 year follow-up study gathered similar data to Knott *et al.*, and aims to provide a current snapshot of MH presentations to Victorian EDs. It also aims to identify major changes in MH presentations and management in the last 10 years through comparison with the original 2004 study data.

Methods

Study design

This was a multicentre retrospective study conducted between 14 May and 13 October 2013, across four metropolitan and regional EDs in Victoria. The Alfred Hospital is a tertiary referral adult hospital and a major trauma centre located close to Melbourne's central business district (CBD) and has 60 000 annual ED presentations and a 50% admission rate. Royal Melbourne Hospital is also a tertiary referral adult hospital and a major trauma centre adjacent to the CBD with 63 000 presentations and a 43% admission rate. Dandenong Hospital, a major urban hospital located 35 km southeast of the CBD, has 47 000 presentations and a 45% admission rate. Geelong Hospital is a major regional hospital 75 km southwest of the CBD and has 64 000 presentations and a 38% admission rate.[4] Dates were chosen to match the corresponding period in the original 2004 study.[9] In 2004, data were also obtained from Maroondah Hospital, but this site was unable to be included in the current study, and the 2004 data from Maroondah were excluded.

Participants

Patients were included if they presented during the study period and had a presentation defined by an International Classification of Diseases (version 10) (ICD-10) diagnosis of a MH disorder or illness, substance abuse or crisis situation; any patient referred for review by the Emergency Crisis Assessment Team (ECAT) or psychiatric unit; or any patient with a documented presenting complaint of deliberate self-harm, suicidal ideation or other psychiatric problem (e.g. violent behaviour and general psychiatric examination). Patients were excluded if the presentation was simple intoxication (e.g. ICD-10 diagnosis F-100, with no referral to ECAT), they had an ICD-10 discharge code for delirium or dementia (ICD-10 codes F050, F051, F059 and F03) or they were under 18 years of age. Participants were identified using each site's electronic medical record system.

Data collection

Unlike the previous study of Knott *et al.*, where data were extracted manually from scanned medical records, this study used reports generated from the electronic medical record at each site to extract variables of interest. Variables extracted and analysed directly from reports included age, gender, method of presentation, discharge diagnosis, triage time and category, discharge time and destination. For patients with multiple ICD-10 discharge codes, only the primary ICD-10 code was used for analysis. ED length of stay (LOS) was calculated as the duration between documented triage time and the time patient left the ED. Time 'seen by clinician' was calculated as the duration between triage time and when ED medical staff first assessed the patient. Determination of ethanol or drug exposure was carried out using a word search for key terms specific to each drug class (e.g. 'ETOH', 'alcohol' and 'drunk' for ethanol intoxication) within the triage comments provided.[10,11] Patients with automated hits for key terms were subsequently checked manually to ensure the algorithm was accurate in determining ethanol or drug exposure. All documented clinical imaging and pathology investigative requests (e.g. chest X-ray, head computed tomography and full blood exam) were considered when determining whether or not patients had any investigations while in the ED. Restrictive interventions including physical and chemical restraint were obtained from security logs. Chemical restraint was defined as the need for parenteral medication to manage acute agitation.

Statistical analysis and sample size

Comparisons between sites were completed to determine local variability in ED management of MH patients. Comparisons were also conducted between 2013 data and original 2004 data to determine temporal changes in MH presentations and management across Victorian EDs.

Data were entered into Microsoft Excel (v. 2013) and subsequently analysed using STATA version 10.0 (StataCorp, College Station, TX, USA). Proportions were compared using χ^2 tests; parametric variables were examined with t-test or analysis of variance and non-parametric variables using the Mann–Whitney or Kruskal–Wallis test as appropriate. For the analysis, all presentations at each site and across the 10 years were considered as independent events. A P-value of <0.01 was considered to be statistically significant.

In 2004, the median time to see a ED clinician was 25 min. Assuming this to be normally distributed with a standard deviation of 15 min and setting the power at 80% and the significance at 0.01, 1315 patients would be required in each sample to detect a 2 min change. Similarly, in 2004, the median ED LOS was 258 min. If this was normally distributed with a standard deviation of 120 min and setting the power at 80% and the significance at 0.01, 1497 patients would be required in each sample to detect a 15 min change. In 2013, the four EDs saw approximately 244 000 total presentations.[4] The proportion of patients with an ICD-10 diagnosis code for an MH disorder is approximated at 6.8%, with 25% of these attributed to simple ethanol intoxication alone.[9,12,13] Therefore, it was expected that the four EDs would see approximately 12 500 MH presentations per annum excluding simple intoxication and anticipate including 5260 MH presentations from the 5 month study period.

This study was approved in accordance with the ethics committees of Alfred Health, Barwon Health, Melbourne Health and Monash Health.

Results

There were 5659 MH presentations across the four sites during the 2013 study period and 2788 MH presentations from the 2004 study included for analysis. This MH population

TABLE 1. *Summary of 2013 mental health presentations by site*

	RMH	Dandenong	Geelong	Alfred	*P*
Total ED presentations	25 747	25 342	26 592	24 578	NA
Total MH presentations (%)	1496 (5.8)	1640 (6.5)	1098 (4.1)	1425 (5.8)	<0.01
Male, %	55.0	53.3	55.5	54.5	0.68
Age (year)					
Median (IQR)	34 (25–45)	35 (25–46)	35 (25–45)	36 (27–47)	0.04
≥60, *n* (%)	120 (8.0)	124 (7.6)	89 (8.1)	85 (6.0)	0.11
≤25, *n* (%)	391 (26.1)	426 (26.0)	285 (26.0)	311 (21.9)	0.02
Presentation, *n* (%)					
Ambulance	718 (48.0)	731 (44.6)	448 (40.8)	656 (46.0)	<0.01
Police	179 (12.0)	209 (12.7)	132 (12.0)	206 (14.5)	0.18
Other	599 (40.0)	700 (42.7)	518 (47.2)	563 (39.5)	<0.01
Time to see clinician					
Median, h:mm (IQR)	1:13 (0:32–2:11)	0:55 (0:10–2:17)	0:40 (0:12–1:32)	0:19 (0:07–0:40)	<0.01
Max	7:58	11:14	9:51	5:19	NA
Investigations in ED, *n* (% yes)	445 (29.8)	662 (40.4)	†	684 (48.0)	<0.01
Referral made to ECATT/psych unit (%)	874 (58.4)	1286 (78.4)	883 (80.4)	839 (58.9)	<0.01
Code greys					
Codes called, *n* (%)	250 (16.7)	84 (7.3)	37 (3.4)	233 (16.4)	<0.01
Chemical restraint, *n* (%)	81 (32.4)	†	12 (32.4)	72 (30.9)	0.94
Physical restraint, *n* (%)	127 (50.8)	†	25 (67.6)	61 (26.2)	<0.01
ED length of stay					
Median h:mm (IQR)	4:05 (2:32–6:55)	3:17 (1:54–5:27)	2:43 (1:34–4:53)	3:05 (1:57–3:56)	<0.01
Max	23:44	47:54	30:34	23:55	NA
>4 h, *n* (%)	758 (50.7)	573 (35.0)	344 (31.3)	327 (22.9)	<0.01
>24 h, *n* (%)	0 (0)	8 (0.5)	1 (0.1)	0 (0)	<0.01
Disposition, *n* (%)					<0.01
Usual residence	864 (57.8)	684 (41.7)	636 (57.9)	552 (38.7)	
Medical ward	140 (9.4)	64 (3.9)	91 (8.3)	143 (10.0)	
Mental health ward	225 (15.0)	203 (12.4)	205 (18.7)	168 (11.8)	
DNW	36 (2.4)	56 (3.4)	72 (6.6)	13 (0.9)	
Absconded	104 (7.0)	93 (5.7)	37 (3.4)	29 (2.0)	
Police	11 (0.7)	14 (0.9)	14 (1.3)	2 (0.1)	
Short stay unit	81 (5.4)	513 (31.3)	34 (3.1)	515 (36.1)	
Other	35 (2.3)	13 (0.8)	9 (0.8)	3 (0.21)	

†Incomplete dataset. DNW, did not wait to be seen; ECATT, Emergency Crisis Assessment Treatment Team; IQR, interquartile range; MH, mental health; NA, not applicable; RMH, Royal Melbourne Hospital.

made up approximately 5.5% of all ED presentations in the 2013 study period, an increase from 4.2% in 2004.

TABLE 2. *Temporal comparison of results between 2004 and 2013*

	2004	2013	*P*
Total ED presentations, *n*	66 786	102 259	NA
Total MH presentations, *n* (%)	2788 (4.2)	5659 (5.5)	<0.01
Male, %	54.1	54.5	0.76
Age (year)			
Median (IQR)	34 (26–44)	35 (26–46)	0.05
>60, *n* (%)	214 (7.7)	418 (7.4)	0.67
<25, *n* (%)	627 (22.5)	1413 (25.0)	0.01
Presentation, *n* (%)			
Ambulance	991 (35.6)	2553 (45.1)	<0.01
Police	475 (17.1)	726 (12.8)	<0.01
Other	1322 (47.4)	2380 (42.1)	<0.01
Triage category, *n* (%)			<0.01
1 (to be seen immediately)	34 (1.22)	139 (2.49)	
2 (to be seen within 10 min)	260 (9.39)	919 (16.24)	
3 (to be seen within 30 min)	1071 (38.55)	2629 (46.46)	
4 (to be seen within 60 min)	1177 (42.37)	1667 (29.46)	
5 (to be seen within 120 min)	236 (8.50)	305 (5.39)	
Time to see clinician			
Median, h:mm (IQR)	0:25 (0:10–0:58)	0:40 (0:13–1:39)	<0.01
Max	9:50	11:14	NA
Investigations in ED, (% yes)	1118 (40.10)	1791 (39.27)	0.48
Referral to ECATT/psych, *n* (%)	2243 (80.45)	3882 (68.60)	<0.01
Code greys			
Codes called, *n* (%)	241 (8.69)	604 (11.66)	<0.01
Chemical restraint, *n* (%)	141 (58.51)	165 (31.73)	<0.01
Physical restraint, *n* (%)	114 (47.3)	213 (40.96)	0.10
ED length of stay			
Median, h:mm (IQR)	4:18 (2:09–10:17)	3:20 (1:58–5:26)	<0.01
Max	119:12	47:54	NA
>4 h, *n* (%)	1464 (52.5)	2002 (35.4)	<0.01
>24 h, *n* (%)	166 (6.0)	9 (0.16)	<0.01
Disposition from ED, *n* (%)			<0.01
Usual residence	1612 (58.38)	2736 (48.35)	
Medical ward	186 (6.74)	438 (7.74)	
Mental health ward	656 (23.76)	801 (14.15)	
DNW/absconded	179 (6.49)	440 (7.78)	
Short stay unit	25 (0.91)	1143 (20.20)	
Other	103 (3.73)	101 (1.78)	

DNW, did not wait to be seen; ECATT, Enhanced Crisis Assessment Treatment Team; IQR, interquartile range; MH, mental health; NA, not applicable.

Demographics and presentations

Table 1 provides a summary of variables across the four sites in 2013; Table 2 compares results from 2004 to 2013. There was no variation in presentations across days of the week or months of the year among sites or between the 2004 and 2013 periods. There was a similar gender distribution across sites with a slight male majority, and this was comparable with that found in 2004. Age distributions were also similar across sites and years; however, there was an increase in the proportion of MH patients under 25 years of age.

Method of presentation to the ED was similar across sites in 2013. However, from 2004 to 2013, there was a significant increase in presentations by ambulance service, and a significant drop in those brought in by police. There was also an increase in acuity of MH patients at triage, with high-acuity patients (ATS categories 1 and 2) increasing from 10.5% of presentations in 2004 to 18.5% in 2013 ($P < 0.001$). There were differences in the triage acuity of presentations between sites in 2013, but with no specific trend.

Reason for presentation

Table 3 shows that final diagnoses including schizophrenia, anxiety and alcohol intoxication have remained stable since 2004. However, there is a shift from depression-related presentations towards suicidal ideation/self-harm, with presentations secondary to depression falling while those with suicidal ideation increased.

Management

Figure 1 shows the variability in ED LOS among the sites in 2013. Royal Melbourne Hospital had the highest median LOS of 4:05 h, and Geelong had the shortest time of 2:43 h ($P < 0.001$). There was improvement from 2004 to 2013 in the EDs' ability to discharge patients quickly, with a reduction in median LOS from 4:18 h to 3:20 h ($P < 0.001$). Figure 2 illustrates the proportion of patients staying in ED longer than 4 h across the four sites and compares eras. There was variability among sites, but overall a decrease in proportion of prolonged stays from 2004 to 2013. Furthermore, Tables 1 and 2 show that ED presentations with stays

TABLE 3. *Mental health issues and intoxication at presentation*

	2004	2013	P
Mental health issue†, n (%)			
Poisoning with drug, T391–T509	283 (10.2)	663 (11.7)	0.04
Anxiety, F419	268 (9.6)	549 (9.7)	0.93
Suicidal ideation/physical, Z915 and R4581	101 (3.6)	424 (7.5)	<0.01
Depression, F3290	441 (15.8)	408 (7.2)	<0.01
Schizophrenia, F209	202 (7.2)	402 (7.1)	0.85
Psychotic episode, F2390	297 (10.7)	320 (5.7)	<0.01
Alcohol intoxication, F100–F109	151 (5.4)	262 (4.6)	0.13
Unknown‡	97 (3.5)	521 (9.2)	<0.01
Other	948 (34.0)	2110 (37.3)	<0.01
Intoxication§, n (%)			
None	1899 (68.11)	4109 (72.61)	<0.01
Alcohol	462 (16.57)	897 (15.85)	0.40
Methamphetamines	62 (2.22)	245 (4.33)	<0.01
Ecstasy	16 (0.57)	20 (0.35)	0.14
Benzodiazepines	159 (5.70)	278 (4.91)	0.12
Marijuana	57 (2.04)	78 (1.38)	0.02
Narcotics	60 (2.15)	108 (1.91)	0.45
Cocaine	4 (0.14)	14 (0.25)	0.33
Chroming	6 (0.22)	7 (0.12)	0.31
GHB	4 (0.14)	128 (2.26)	<0.01
Other	164 (5.88)	97 (1.71)	<0.01

†Primary International Classification of Diseases (version 10) discharge codes used to classify each mental health issue are listed in the table. ‡International Classification of Diseases (version 10) code not available/recorded. §Multiple drugs per patient possible. GHB, gamma-hydroxybutyric acid.

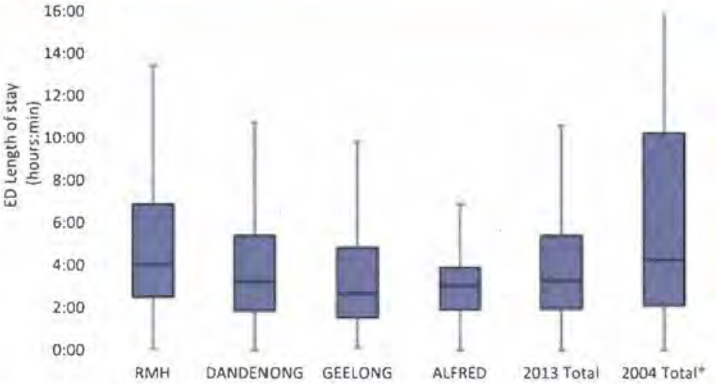

Figure 1. *ED length of stay for patients with mental health issues. Whiskers represent the lowest and highest datum still within 1.5 times the interquartile range from the lower and upper quartiles. All data are from the 2013 period except the comparative 2004 total.* **Positive whisker for 2004 total ends at 22:29. RMH, Royal Melbourne Hospital.*

over 24 h were significantly reduced with two of the four sites having zero such presentations in 2013.

Figure 3 shows that the median time to see a clinician varied among sites, ranging from 19 to 73 min ($P < 0.001$), with an increased time between 2004 and 2013 (25 to 40 min, respectively, $P < 0.001$). The proportion of MH patients who underwent any investigation while in the ED showed no change from 2004 to 2013 (Table 2).

There was a total of 604 security codes for an unarmed threat (code grey) called across the four sites in 2013, representing 11.7% of all MH presentations. Significant variation in the code grey rate between sites was observed. Overall, there was an increase in code grey numbers and rates between 2004 and 2013. Despite this, comparing 2004 with 2013, lower proportions of MH patients required physical or chemical restraint.

Disposition

There was significant variability in discharge disposition between sites. The most important difference was seen in the use of short stay units (SSUs). Significant variability was again noted between sites. Between 2004 and 2013, the use of SSU as a discharge destination for this patient population increased from <1% to 20%.

Intoxication

There was little variation in the proportion of MH patients presenting intoxication among the sites, but this changed from 2004 and is summarised in Table 3. While fewer patients presented with ethanol or drug intoxication in 2013 compared with 2004, exposure to methamphetamines has nearly doubled in prevalence. Exposure to gamma-hydroxybutyric acid also significantly increased. Exposure to substances such as marijuana, opioids, benzodiazepines and alcohol all showed a relative decline between 2004 and 2013.

Discussion

This study describes the current clinical picture of MH presentations across four hospital EDs in Victoria, as well as the major changes in management of these presentations in the past 10 years. Despite the increasing presentations and acuity, changes in ED practice have allowed for improvements in the delivery of care through shortened

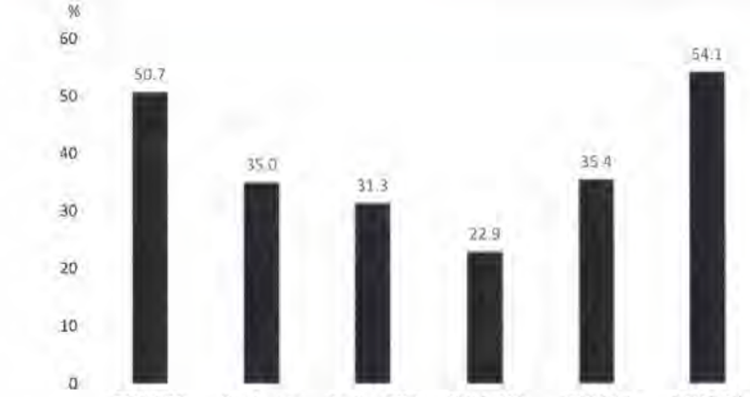

Figure 2. *Proportion of presentations due to mental health issues with ED length of stay >4 h. RMH, Royal Melbourne Hospital.*

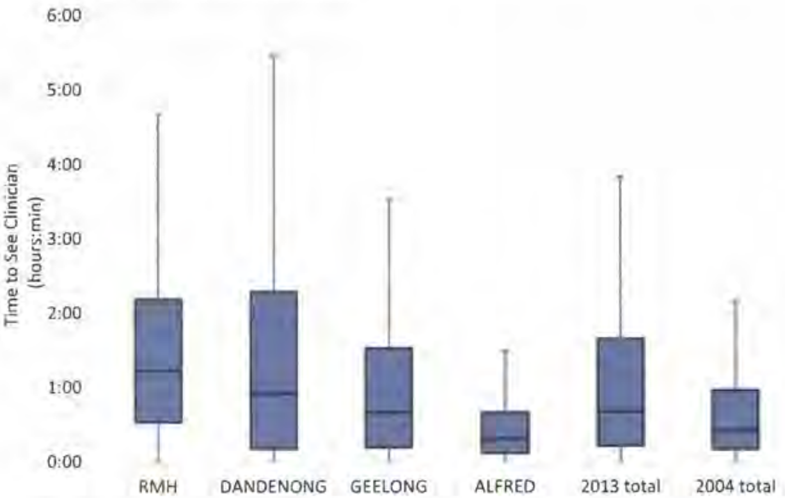

Figure 3. *Wait times to see clinician by patients with mental health issues. Whiskers represent the lowest and highest datum still within 1.5 times the interquartile range from the lower and upper quartiles. All data are from the 2013 period except the comparative 2004 total. RMH, Royal Melbourne Hospital.*

ED LOS and a decrease in the use of restrictive interventions.

The study found a 53% increase in total ED presentations from 2004. This is attributed mostly to population growth and is in line with previous estimates.[14] However, the proportion represented by MH patients has risen since 2004. This may support concerns that community MH services are not meeting the demands of a growing population. Patients arriving in the ED have higher acuity based on triage scores, and there is an increase in the proportion under 25 years old and those exposed to amphetamines. Dedicated services focusing on early intervention for MH disorders in young adults, such as Headspace, may be required. Headspace is a federally funded community service programme offering MH counselling and intervention to the youth demographic.[15,16] Not only does the vast majority of mental illness emerge before the age of 25 years but the 20 to 24 year age bracket also has the highest rate of suicide.[17]

Reasons for presentation remain largely unchanged in the past 10 years with anxiety, drug intoxication, depression and suicidality as the main contributors. The 2013 national report on MH suggests that rates of depression and suicidality have remained constant in recent years.[18] Interestingly, this study found a significant change in the rates of depression and suicidality as causes for ED presentations. This finding may be a reflection of the limitation of using primary ICD-10 codes for analysis rather than actual trends.

Despite an overall increase in ED presentations, the median LOS fell over the 10 year period, which may suggest successful introduction of new models of care. Innovative changes in ED practice including the implementation of SSUs and Psychiatric Assessment and Planning Units may be contributory; there was a 22-fold increase in the proportion of MH patients discharged to SSUs. Importantly, hospitals that had greater proportions of SSU discharges in 2013 had fewer presentations with ED LOS over 4 h. As a key indicator of improved patient care, ED stays over 24 h have essentially been eliminated. This is an encouraging result for Victorian EDs as prolonged stays were usually attributed to system failures (e.g. unavailability of MH beds).[9] A strong driving force for the reduced ED LOS may have been the recent National Emergency Access Target recommendations to decrease ED discharge times to below 4 h.[5] Promisingly, Psychiatric Assessment and Planning Units have led to improved performance with reduced ED LOS and reduced code greys.[7] While the number of MH presentations increased over the 10 year period, the proportion referred to ECAT fell significantly. Based on triage scores, the acuity of patients was higher in 2013, which might have increased referral rate. The reason for the fall is unclear and might be due to saturation of ECAT workload or improved competency or confidence of the ED staff. It may also be a consequence of the need to move patients through the ED within 4 h, leading to an avoidance of secondary referrals. Further research is required to understand both the reason for the decrease in referrals and its consequences.

Over 60% of presentations in 2013 did not have any pathology or radiology investigations while in ED. It is likely that a significant proportion of patients in ED requiring psychiatric assessment do not need a medical workup. If these patients could be assessed in a community setting and only referred to ED if further medical services were required, the strain and resource burden on EDs might be alleviated. Further evaluation is required to determine whether patients not undergoing investigative services had any benefit from their ED attendance. The observed rise in code greys, together with a reduction in the use of restraints, may reflect a lowering in the threshold (or improved anticipation of aggression) for these alerts. In addition, it may reflect improved management of events by the clinical and security staff.

Of public interest is the doubling in methamphetamine use among patients with MH presentations since 2004. This is in line with Victoria-wide reports suggesting an overall increase in methamphetamine use.[19–21]

Limitations

Limitations of this study are acknowledged and largely attributed to the use of electronic reporting and the complexities of the study population. Each study site had differing electronic systems and reports available, and certain variables were not readily available, resulting in incomplete datasets. The use of target-word searches within triage text to identify intoxications may have underreported the true rate, although this methodology has been previously validated.[10,11] Finally, patient selection was complicated as each presentation is attributed a single ICD-10 code and MH patients have high rates of comorbidities. Some patients may have been missed if assigned a non-MH code (for example, laceration of arm) for a MH disorder (self-harm). This was countered by manually looking at a documented presenting complaint and referral to MH clinicians, including ECAT.

It is important to note that the original 2004 study utilised manual extraction of data from medical records, which was a thorough but resource-demanding method. Extraction from electronic records provides high-quality data far more readily. This approach should allow temporal comparisons to be readily conducted in the future, allowing close monitoring of changes in ED performance and MH presentations, and provide nimble feedback about success of changing practices. Further development of the electronic systems and optimising these for data extraction would seamlessly facilitate research across all levels and disciplines.[22]

Conclusion

Despite increasing MH-related presentations, changes in ED practice have allowed for improvements in the delivery of care through a shortened ED LOS and the virtual elimination of very long stays over 24 h. However, there continues to be significant variability in management and performance across hospital sites. There has been a disproportionate increase in patients presenting with concurrent exposure to amphetamines and unarmed threat to patients and/or staff in the context of such presentations. Identifying which interventions lead to standout site performance, and their subsequent application more broadly, may improve future ED delivery of care.

Acknowledgements

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Author contributions

PAM and JK originally conceived the study. All authors were subsequently involved in the design, data collection and manuscript preparation. The analysis was undertaken by JK.

Competing interests

None declared.

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Royal Commission into
Victoria's Mental Health System

ATTACHMENT RB-15

This is the attachment marked '**RB-15**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

OPEN ACCESS

Childhood adversity and risk of suicide: cohort study of 548 721 adolescents and young adults in Sweden

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ABSTRACT

OBJECTIVE

To examine the relation between childhood adversity, the role of school performance, and childhood psychopathology and the risk of suicide.

DESIGN

Cohort study of register based indicators of childhood adversity (at ages 0-14) including death in the family (suicide analysed separately), parental substance abuse, parental psychiatric disorder, substantial parental criminality, parental separation/single parent household, receipt of public assistance, and residential instability.

SETTING

Swedish medical birth register and various Swedish population based registers.

PARTICIPANTS

548 721 individuals born 1987-91.

MAIN OUTCOME MEASURES

Estimates of suicide risk at ages 15-24 calculated as incidence rate ratios adjusted for time at risk and confounders.

RESULTS

Adjusted incidence rate ratios for the relation between childhood adversity and suicide during adolescence and young adulthood ranged from 1.6 (95% confidence interval 1.1 to 2.4) for residential instability to 2.9 (1.4 to 5.9) for suicide in the family. There was a dose-response relation between accumulating childhood adversity and risk: 1.1 (0.9 to 1.4) for those exposed to one adversity and 1.9 (1.4 to 2.5) and 2.6 (1.9 to 3.4) for those exposed to two and three or more adversities, respectively. The association with increased risk of suicide remained even after adjustment for school performance and childhood psychopathology.

CONCLUSION

Childhood adversity is a risk factor for suicide in adolescence and young adulthood, particularly accumulated adversity. These results emphasise the importance of understanding the social mechanisms of suicide and the need for effective interventions early in life, aiming to alleviate the risk in disadvantaged children.

WHAT IS ALREADY KNOWN ON THIS TOPIC

Exposure to adversity in childhood increases the risk for self harm in adolescence and young adulthood, and the risk of self harm is particularly increased in young people exposed to cumulative adversities

Whether childhood adversity is associated with an increased risk for death by suicide is less clear

WHAT THIS STUDY ADDS

Exposure to various common childhood adversities, such as parental psychiatric disorder, parental substance abuse, death in the family, and receipt of public assistance, is associated with a substantially increased risk of suicide in adolescence and young adulthood

The risk is clearly increased in young people exposed to cumulative adversities

These results emphasise the importance of understanding the social mechanisms of suicide and the need for effective interventions early in life aimed at alleviating the suicide risk in disadvantaged children

Introduction

Despite the overall decline in suicide rates in Western countries during the past decades, there has not been a similar decline among adolescents and young adults.[1,2] Suicide in young people is increasing[1,3] and is ranked as one of the leading causes of death in those aged 15-29.[1-4] Identification of the most likely risk factors for suicide early in life has important implications for future public health interventions.[1,2,5]

Established risk factors for suicide attempts and suicidal ideation during adolescence and young adulthood include childhood adversities, such as abuse and neglect[6,7] and growing up in a dysfunctional household.[1,8] Childhood adversity is usually denoted by a range of indicators, such as parental separation or divorce, death in the family, substance abuse and criminality in the home, childhood poverty, residential instability, and parental psychopathology.[9] Few previous studies have examined single indicators and suicide risk among adolescents and young adults.[8,10-17] Furthermore, they have used small samples, ranging from 113 to 15 117 participants and have not focused specifically on childhood adversity.[8,10-12] For example, young people who die by suicide are more likely to come from non-intact families (such as families where both biological parents are not present) although parental psychopathology is likely to confound this association.[13] Other studies have found that parental psychopathology, including depression and substance abuse and antisocial behaviour, is associated with increased risk for suicide in adolescence.[11] Several studies have also found loss of a parent, either to death or divorce, to be a significant risk factor for later suicide.[10,14]

Indicators of childhood adversity tend to occur in clusters, rather than as single events,[9,15,16] and are often inter-related. It has previously been shown that clustered indicators have a strong positive relation to suicide ideation and attempts in young adulthood.[6,7,17-20] We recently showed that exposure to childhood adversity was positively associated with the risk for intentional self harm in young adulthood,[21] and the risk increased stepwise by number of accumulating indicators. We also found that childhood psychopathology and poor school performance were associated with increased risks for self harm among individuals exposed to childhood adversity, though adversity increased the risk for self harm independently of these factors.[21]

Other studies have shown that adults aged 18-69 who were exposed to cumulative indicators of childhood adversity have an increased risk for premature death in general.[22 23] No previous study, however, has examined the association between cumulative exposure to childhood adversity and death by suicide in adolescence and young adulthood.

We capitalised on Sweden's extensive and high quality nationwide registers to investigate the differential associations between a set of indicators for childhood adversity and the risk of suicide in late adolescence and young adulthood up to age 24. We also examined whether the association between cumulative exposure to childhood adversity and suicide could be explained by childhood psychopathology. Given the fact that poor school performance is associated with childhood adversity[24-26] and is a risk indicator for suicide,[27] we also investigated whether it could contribute to any association.

Methods

Study population

The study population was defined as all individuals born in Sweden and recorded in the medical birth register in 1987-91 (n=571 797). This high quality register includes data on all deliveries in Sweden since 1973.[28] After we excluded those who died before age 15 (n=4457), those who emigrated before age 15 (n=18 345), and those who were adopted (n=274), our final cohort comprised 548 721 individuals.

We used the unique Swedish personal identity number[29] to link information from several population based registers:

- The causes of death register comprises information on all deaths of Swedish residents since 1952 with causes of death coded according to ICD (international classification of diseases)
- The national patient register includes all individuals admitted to psychiatric or general hospitals, with complete coverage for all inpatient care since 1987 and for specialised outpatient care since 2001[30]
- The total enumeration income survey contains data on income and governmental benefits provided to all Swedish residents. The total population register includes information on age, sex, and place of residency[31]
- The longitudinal integration database for health insurance and labour market studies contains data from the labour market and from the educational and social sectors
- The register of court convictions holds information on all court convictions in Sweden for people aged 15 and older
- The national school register holds information on individual school performance (grade points by subject) for all students from the final ninth year in primary schools (when students are aged 15-16) since 1988. Private schools, which comprise just a small proportion of all Swedish schools, have been included since 1993. The quality of the data in the school register is high.[32] Missing data are mostly because of lack of reporting from certain private schools. Not being registered in the school register could also be an indication that the person did her/his compulsory schooling in special education because of cognitive difficulties.

Indicators of childhood adversity

We selected indicators of childhood adversity based on previous research showing them to have significant adverse health implications.[9 33-39] We included seven indicators occurring between birth and age 14:

- Death in family (suicide was analysed separately): death of a parent or a sibling
- Parental substance abuse (severe, as we capture only inpatient care): at least one parent admitted to hospital with a main diagnosis for substance abuse (ICD-9: 291-292, 303-3050, 3570, 4255, 5353, 5710, 5711-[illegible] 6483, 6555, 9650, 9696-9697; ICD-10: E244, F10-[illegible], F18-F19, G312, G621, G721, I426, K292, K70, K852, K86, O354-355, P044, T40, T436, T51, Z502-503, Z714, Z721-Z722)
- Parental psychiatric disorder (severe, as we capture only inpatient care): admission of parent to hospital for psychiatric disorder (excluding disorders related to substance abuse) (ICD-9: 290-319; ICD-10: F00-F99)
- Parental criminality: a parent sentenced to prison, probation, or forensic psychiatric care
- Parental separation/single parent household: either having parents separated or living in a single parent household, or both
- Household receiving public assistance: at least one parent having received public assistance during at least one year
- Residential instability: two or more changes in place of residence.

By relying solely on register data, there were indicators of childhood adversity that we were not able to study, including abuse and neglect.

Suicide

The study participants were prospectively followed from age 15 with respect to suicide. Suicide was defined by the presence of ICD-10 codes X60-X84 or as death with undetermined intent (Y10-Y34) as the underlying cause of death in the causes of death register. The latter reduces spatial and secular trends in detecting and classifying cases of suicide where intent is indeterminable.[40]

Covariates

Because of known associations between immigrant status (including second generation) and mental health in the Swedish population,[41] we included information on whether the parents of cohort members were born in Sweden or not. People from disadvantaged family backgrounds are more likely to experience childhood adversities than those born in more privileged families.[42] Thus we included parental educational attainment and disposable income, measured when the child was aged 15. Parental educational attainment was classified into three categories: ≤9 years, 10-12 years, and ≥13 years.

Disposable income was assessed with the individualised weighted average family income and categorised into quarters.

Childhood psychopathology was defined as any inpatient and/or outpatient treatment with a psychiatric diagnosis (chapter F in ICD-10) before age 15, recorded in the national patient register.

School performance was based on the grade point average from the final (ninth) year of compulsory school. The average was based on the student's 16 best subjects. The child earned 10-20 points per subject passed, yielding a total maximum grade point of 320 points. Thus, the average spanned from 10 to 20 (maximum points divided by number of subjects). We categorised it into quarters and added two separate groups for those with incomplete grades and those with missing grades. Missing values in the national school register are not random. Missing refers mainly to those who have graduated in another country and to those who, because of cognitive difficulties, did not graduate from compulsory school.[43] Incomplete grades refer to instances where the students failed in one or more subjects.

We also included sex and year of birth in all analyses.

Statistical analysis

The individuals in our cohort were followed from age 15 (2002-06) until suicide, death from other causes, or to 31 December 2011—that is, until age 24 at most, depending on year of birth. We used multivariate Poisson regression analyses by aggregating number of years at risk and adjusting for potential confounders using a stepwise approach. The final multivariate model was adjusted for year of birth, sex, foreign born parent, parental educational attainment, parental income, school grades, and childhood psychopathology. We summed the total number of childhood adversities to assess accumulation of indicators in separate analyses. Three adversities or more were categorised into one group (≥3). In these analyses we also used a stepwise approach and present the crude and the adjusted multivariate model, in which we adjusted for year of birth, sex, foreign born parent, parental educational attainment, parental income, school grades, and childhood psychopathology.

Sensitivity analyses

Parental psychiatric disorder is a proxy for genetic liability for psychiatric disorder and could increase the risk of other childhood adversities. Thus, in secondary analyses, we excluded parental psychiatric disorder from the list of adversities and considered a confounder instead.

All statistical analyses were conducted with SAS v.9.4.

Patient involvement

No patients were involved in setting the research question or the outcome measures, nor were they involved in developing plans for design or implementation of the study. No patients were asked to advise on interpretation or writing up of results. There are no plans to disseminate the results of the research to study participants or the relevant patient community.

Results

Table 1 shows that 42% of the participants were exposed to at least one indicator of childhood adversity. The most prevalent indicators were parental separation/single parent household (29%) and household receiving public assistance (20%). Compared with children without any such experience, those exposed to at least one childhood adversity were more likely to perform worse in school, experience childhood psychopathology, have parents with lower levels of education and income, and have parents who were born outside of Sweden.

Table 2 shows the number of participants who had experienced the seven different indicators of childhood adversity and combinations thereof. Of the 23 145 who had experienced parental criminality, 14 959 (64%) had also experienced parental substance abuse. Further, of the 108 754 who had experienced receipt of public assistance 62 245 (57%) had also experienced parental separation.

During follow-up, 431 individuals in the study cohort died by suicide (81 (18.8%) were classified as undetermined intent), corresponding to an average suicide rate of 10.6 per 100 000 person years (95% confidence interval 9.6 to 11.6) (table 3). Highest suicide rates per 100 000 person years were found among those exposed to suicide in the family (34.9, 15.1 to 68.8), parental psychiatric disorder (27.8, 20.4 to 36.9), and substantial parental criminality (26.6, 20.0 to 34.5). Except for parental separation/single parent household, all childhood adversity indicators were associated with about twice the suicide risk compared with those without experience of childhood adversity, spanning from incidence rate ratio of 1.6 (95% confidence interval 1.1 to 2.4) for residential instability to 2.9 (1.4 to 5.9) for suicide in the family.

We found a dose-response relation between number of childhood adversity indicators and risk for suicide. The incidence rate ratio was 1.1 (95% confidence interval 0.9 to 1.4) for one adversity, 1.9 (1.4 to 2.5) for two adversities, and 2.6 (1.9 to 3.4) for three or more, after adjustment for important covariates including childhood psychopathology and school performance (table 3).

Experience of childhood psychopathology did not entail higher suicide risk compared with those without such experience (incidence rate ratio 0.8, 95% confidence interval 0.4 to 1.7). Poor school performance, on the other hand, was associated with higher suicide risk. Compared with those with highest grades, students with lowest grades had twice the suicide risk (2.0, 1.4 to 2.8), students with incomplete grades had over three times the risk (3.6, 2.5 to 5.3), and finally students with missing grades had over four times the risk (4.5, 2.7 to 7.3) (table 3).

Last, we performed sensitivity analyses in which we excluded parental psychiatric disorder from the list of childhood adversities and instead considered it a confounder. In these analyses, the association between adversities and suicide remained significant (see appendix).

Discussion

Main findings

Although previous research has shown that exposure to childhood adversity is associated with a substantial increase in the risk of suicide ideation and suicide

Table 1 | Descriptive characteristics of population in study of risk of suicide in adolescents and young adults in Sweden. Figures are numbers (percentage)

	All	No indicators	Death in family	Suicide in family	Parental substance abuse	Substantial parental crime	Parental psychiatric disorder	Separation/single parent household	Household public assistance	Residential instability
Total	548721	317023 (58)	17784 (3)	3074 (1)	40524 (7)	23145 (4)	28369 (5)	161789 (29)	108754 (20)	19222 (4)
Females	266928 (49)	153349 (48)	8656 (49)	1533 (50)	19875 (49)	11351 (49)	13747 (48)	79692 (49)	52891 (49)	9621 (50)
School performance (quarter of average school grade):										
1	140014 (26)	69445 (2)	5158 (29)	937(30)	13362 (33)	7852 (34)	8491 (30)	49231(30)	36494 (34)	5840 (31)
2	119077 (22)	71443 (23)	3596 (20)	593 (20)	7423 (18)	4012 (17)	5554 (20)	33645 (21)	19935 (18)	3504 (18)
3	108069 (20)	72014 (23)	2736 (15)	421 (14)	4994 (12)	2470 (11)	4147 (15)	25844 (16)	12723 (12)	2476 (13)
4	113589 (21)	82349 (26)	2623 (15)	363 (12)	3596 (9)	1645 (7)	3713 (13)	22082 (14)	8862 (8)	2447 (13)
Missing	13702 (3)	5183 (2)	813 (5)	144 (5)	2003 (5)	1384 (6)	1409 (5)	5484 (3)	5815 (5)	1127 (6)
Incomplete grades	54270 (10)	16589 (5)	2858 (16)	616 (20)	9146 (23)	5782 (25)	1555 (18)	25503 (16)	24925 (23)	3828 (20)
Childhood psychopathology <15	7293 (1)	3088 (1)	335 (2)	59 (2)	894 (2)	565 (2)	800 (3)	2715 (2)	2555(2)	503 (3)
Parental educational attainment (years):										
9	28504 (5)	10,211 (3)	2911 (16)	497 (16)	4472 (11)	3068 (13)	2632 (9)	10746 (7)	13056 (12)	1759 (9)
10-12	278089 (51)	145,599 (46)	9421 (53)	1727 (56)	26308 (65)	15468 (67)	16206 (57)	92043 (57)	69529 (64)	10617 (55)
>12	241751 (44)	161189 (51)	5218 (29)	790 (26)	9633 (24)	4532 (20)	9453 (33)	58817 (36)	25926 (24)	1744 (38)
Missing	377 (0)	24 (0)	234 (1)	60 (16)	111 (0)	77 (0)	78 (1)	183 (0)	243 (0)	52 (0)
Parental income (quarter of distribution):										
1	137710 (25)	60772 (19)	4103 (23)	675 (22)	14741 (36)	9661 (42)	9632 (34)	50062 (31)	46614 (43)	9492 (45)
2	137342 (25)	77384 (24)	3668 (21)	683 (22)	11112 (27)	6254 (27)	7701 (27)	42385 (26)	29848 (27)	6372 (30)
3	136738 [25]	86866 (27)	4133 (23)	755 (25)	8498 (21)	4485 (19)	6120 (22)	35626 (22)	20431 (19)	3384 (16)
4	136931 (25)	92001 (29)	15876 (33)	961 (31)	6173 (15)	2745 (12)	4916 (17)	33716 (21)	11861 (11)	1563 (7)
At least one parent born outside Sweden	94139 (17)	39205 (12)	4052 (23)	614 (20)	10487 (26)	7420 (32)	6639 (23)	32792 (20)	36450 (34)	4970 (26)
Suicides	431 (0.08)	175 (0.06)	28 (0.16)	8 (0.26)	71 (0.18)	48 (0.21)	56 (0.20)	181 (0.11)	154 (0.14)	30 (0.16)

attempts as well as suicide, the association between cumulative exposure to childhood adversity and suicide risk has been less clear.[1 6-8 44] Our study of 548 721 individuals confirms that exposure to childhood adversity is associated with a substantially increased risk of suicide in adolescence and young adulthood and shows that the risk grows higher with increasing number of adversities. The association between adversity and suicide remained after adjustment for parental education and income, school performance, and childhood psychopathology. Exposure to suicide in the family, parental psychiatric disorder, and substantial parental criminality during childhood seem to entail greatest risks of later suicide. Moreover, childhood adversity seems to be such a strong risk factor for suicide in adolescence and young adulthood that it attenuated the effect of other known risk factors, such as poor school performance and childhood psychopathology. Childhood adversity, especially accumulated, increased the risk of suicide independently of these factors in our study.

In line with previous findings,[39 45 46] suicide in the family, parental psychiatric disorder, and parental criminality were associated with greatest suicide risk. For instance a Danish case-control study of 496 young people (aged 10-21) who died by suicide found several parental factors to be associated with an increased risk, such as parental suicide or early death, admission to hospital for a mental illness, unemployment, and low income.[10]

Previous studies have found a dose-response relation between childhood adversity and suicide attempts and between childhood adversity and premature death[16 22]—that is, the higher the number of indicators, the higher the risk. We found this to also be true for suicide mortality.

Experience of childhood adversity increases the risk for disturbed emotional and behavioural self regulation, which could increase the risk for an impulsive and destructive reaction to stress and adversities in adulthood.[47] This could, at least partly, explain the relation between childhood adversity and suicide risk. Furthermore, shared environment effects such as abuse transmission of psychopathology are other possible explanations.[48] We have previously shown childhood adversity to be associated with an increased risk of self harm,[21] which in turn is a strong risk factor for suicide.[13 49] We have also shown that young people with childhood adversity are more likely to have used psychiatric services[50] compared with those without such adversity. This is probably because they have higher rates of psychiatric disorders.[51] Young people exposed to childhood adversity might, nevertheless, be less likely to seek medical care when ill compared with non-exposed children, which might influence their risk of suicide. It is not known how childhood adversity might have influenced help seeking behaviour and use of psychiatric services among young people in our study.

Exposure to childhood adversity is possibly influenced by genetic factors—for example, those related to family history of suicide, parental criminality, psychiatric disorders, and substance abuse among parents—which could also entail a higher likelihood for suicide in exposed children.[52] Adjustment for parental psychiatric disorders, a proxy for children's genetic

Table 2 | Number of individuals who had experienced different childhood adversities and combinations of adversities

	Parental death	Parental substance abuse	Parental crime	Parental psychiatric disorder	Parental separation	Public assistance	Residential instability
Parental death	17784	3582	1900	2327	10854	6500	1120
Parental substance abuse	—	40524	14959	8281	22552	2532	4120
Parental crime	—	—	23145	4077	13086	17833	2848
Parental psychiatric disorder	—	—	—	28369	15519	15009	2552
Parental separation	—	—	—	—	161798	62245	11146
Public assistance	—	—	—	—	—	108754	11339
Residential instability	—	—	—	—	—	—	19222

Table 3 | Association between indicators of childhood adversity and suicide

	No of individuals	No of suicides	Rates of suicide/ 100000 person years	Incidence risk ratio (95% CI)	
				Model I*	Model II†
All	548721	431	10.6 (9.6 to 11.6)	—	—
No indicators	317023	175	7.4 (6.4 to 8.6)	1 (reference)	1 (reference)
Death in family	17784	28	21.0 (14.0 to 30.4)	2.1 (1.4 to 3.0)	1.9 (1.3 to 2.8)
Suicide in family	3074	8	34.9 (15.1 to 68.8)	3.4 (1.7 to 6.7)	2.9 (1.4 to 5.9)
Parental substance abuse	40524	71	23.6 (18.4 to 29.7)	2.5 (1.9 to 3.2)	1.9 (1.4 to 2.4)
Parental psychiatric disorder	28369	48	27.8 (20.4 to 36.9)	2.8 (2.1 to 3.8)	2.0 (1.5 to 2.8)
Substantial parental criminality	23145	56	26.6 (20.0 to 34.5)	2.7 (2.1 to 3.6	2.3 (1.7 to 3.0)
Parental separation/single parent household	161789	181	15.1 (13.0 to 17.5)	1.7 (1.4 to 2.1)	1.4 (1.2 to 1.7)
Household receiving public assistance	108754	154	19.1 (16.1 to 22.3)	2.3 (1.9 to 2.7)	1.6 (1.3 to 2.0)
Residential instability	19222	30	21.0 (14.2 to 30.0)	2,1 (1.4 to 3.0)	1.6 (1.1 to 2.4)
Year of birth:					
1987	99301	106	11.2 (9.2 to 13.5)	1 (reference)	1 (reference)
1988	106375	108	11.9 (9.8 to 14.4)	1.1 (0.8 to 1.4)	1,1 (0.8 to 1.4)
1989	109704	96	11.7 (9.5 to 14.2)	1.0 (0.8 to 1.4)	1.1 (0.8 to 1.4)
1990	116329	64	8.5 (6.6 to 10.7)	0.8 (0.6 to 1.1)	0.8 (0.6 to 1.1)
1991	117012	57	8.8 (6.8 to 11.4)	0.8 (0.6 to 1.1)	0.8 (0.6 to 1.2)
Foreign born parent:					
No	454582	341	10.9 (9.3 to 11.0)	1 (reference)	1 (reference)
Yes	94139	90	13.0 (10.9 to 15.4)	1.3 (1.0 to 1.6)	1.2 (0.9 to 1.5)
Parental educational level:					
Low	28504	26	12.1 (8.1 to 17.4)	0.7 (0.5 to 1.1)	0.8 (0.5 to 1.2)
Medium	278089	258	12.5 (11.0 to 14.1)	1.0 (0.8 to 1.3)	1.1 (0.8 to 1.3)
High	241751	147		1 (reference)	1 (reference)
Child's grade group (quarter):					
1	140014	134	12.9 (10.9 to 15.2)	1.8 (1.2 to 2.6)	2.0 (1.4 to 2.8)
2	119077	81	9.2 (7.3 to 11.3)	1.4 (1.0 to 2.1)	1.5 (1.0 to 2.2)
3	108069	44	5.5 (4.0 to 7.3	1.0 (0.6 to 1.5)	1.0 (0.6 to 1.5)
4	113589	43	5.1 (3.7 to 6.8)	1 (reference)	1 (reference)
Missing	13702	29	29.0 (19.8 to 41.0)	3.8 (2.3 to 6.2)	4.5 (2.7 to 7.3)
Incomplete	54270	100	24.8 (20.3 to 30.0)	3.0 (2.0 to 4.4)	3.6 (2.5 to 5.3)
Childhood psychopathology:					
No	541428	424	10.5 (9.6 to 11.6)	1 (reference)	1 (reference)
Yes	7293	7	13.8 (6.2 to 27.2)	0.8 (0.4 to 1.6)	0.8 (0.4 to 1.7)
Total No of indicators:					
0	317023	175	7.4 (6.4 to 8.6)	reference	1 (reference)
1	127348	88	9.4 (7.1 to 11.5)	1.3 (1.0 to 1.7)	1.1 (0.9 to 1.4)
2	61962	83	18.0 (14.1 to 22.4)	2.5 (1.9 to 3.3)	1.9 (1.4 to 2.5)
≥3	42388	85	26.9 (21.5 to 33.2)	3.7 (2.9 to 4.8)	2.6 (1.9 to 3.4)

*Crude model.

†Adjusted for year of birth, sex, foreign born parent, parental educational level, parental income, school grades, and childhood psychopathology.

loading for psychiatric disorders, however, attenuated but did not explain the associations between childhood adversity and suicide. This finding is in favour of a social causation hypothesis for the association we found between childhood adversity and suicide.

Although childhood adversity was common in our cohort, it is important to note that most children (58%) did not experience any adversity, and 41% (175/431) of suicides during follow-up were in those with no exposure to adversity. Thus, identification of risk factors for suicide in young people other than the adversities we studied remains a challenge but also an opportunity for suicide prevention in the younger age groups. For example, factors such as abuse and neglect, bullying, mood disorders and substance abuse, physical illness, lack of social support, and exposure to peers with suicidal behaviour might be important targets for prevention[53] but were not studied here.

Furthermore, we found that those with a history of exposure to childhood adversity more often performed worse in school and also had a history of childhood psychopathology to a greater extent. In the light of previous evidence that children from adverse family backgrounds tend to show school performance below their potential, based on their cognitive capacity,[54] programmes aimed at boosting school performance and providing social support to disadvantaged children could prove one promising pathway for improved mental health and suicide prevention. Moreover, a chaotic household seems to increase the suicide risk among young people, and previous findings have identified family support as an important intervention target to decrease suicide risk among anxious young people.[55] Family support and involvement in intervention for those at risk is another potentially successful pathway.[56] Lastly, the fact that indicators of childhood adversity often co-occur might have important implications for intervention. Prevention of single indicators among individuals exposed to several is unlikely to have any effects, and universal public health policies aiming to reduce social disadvantage and its impact on children lives are warranted.

Furthermore, the strong associations we found between single childhood adversities and suicide suggest that efforts should also be made to develop selective interventions that effectively alleviate suicide risk in easily identifiable groups at high risk. For example, children exposed to family suicide constitute a relatively small subgroup of all children with childhood adversity in our study but could be easily identified through school, the healthcare system, or social services, all of which are potential arenas for evidence based preventive interventions.

Strengths and limitations

This study has several strengths, including the large cohort size, the longitudinal population based design, and use of national registers with high completeness and validity. Other studies on childhood adversity and mental health have often been retrospective and based on self reported information, entailing risk for recall bias (for example, under-reporting of childhood adversity).[57] Despite these strengths, our findings should be interpreted in the context of the following limitations. The range of indicators of childhood adversity is far from exhaustive, and we did not assess the severity, duration, or sequencing of any of these indicators. Furthermore, several of the indicators capture only the most severe cases (parental substance abuse, parental psychiatric disorder, substantial parental criminality), which should be considered when interpreting the results. Moreover, we do not know how adversity might have influenced treatment seeking in young people, which in turn might influence use of mental health services and eventually the risk of suicide. By relying solely on register data, there are indicators that we were not able to study, including abuse and neglect. Both the consistency of our results with other studies and the large cohort with high quality data, however, lends confidence to the validity of our findings.

Conclusion

In conclusion, this study provides clear evidence that childhood adversities that are common in the general population are associated with an increased risk for suicide in adolescents and young adults. The risk is markedly increased in young people exposed to cumulative adversities. These results emphasise the importance of understanding the social mechanisms of mental health morbidity and suicide and the need for developing effective interventions, aiming to alleviate the risk of suicide in disadvantaged children. This should be done in parallel with wider societal efforts to reduce the size of social disadvantage.

Contributors: All authors are joint senior authors. CB and EB originated the idea, designed the study, and conducted the analyses. All authors interpreted the analyses and critically reviewed and edited the manuscript. CB wrote the manuscript draft, and all authors approved the final version. CB and EB are guarantors.

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Competing interests: All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf (available on request from the corresponding author) and declare: no other financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

Ethical approval: This study was approved by the ethical committee in Stockholm, Sweden (dnrs: 2010/1185-31/1 and 2013/1118-32).

Data sharing: The statistical code is available from the corresponding author. Under Swedish law and ethical approval, patient level data cannot be made available.

Transparency: The lead author affirms that this manuscript is an honest, accurate and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies form the study as planned (and, if relevant, registered) have been explained.

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Appendix 1: Supplementary table

Royal Commission into
Victoria's Mental Health System

ATTACHMENT RB-16

This is the attachment marked '**RB-16**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

American Journal of
Preventive Medicine

REVIEW ARTICLE

A Systematic Review of Trials to Improve Child Outcomes Associated With Adverse Childhood Experiences

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Context: The purpose of this systematic literature review was to summarize current evidence from RCTs for the efficacy of interventions involving pediatric health care to prevent poor outcomes associated with adverse childhood experiences measured in childhood (C-ACEs).

Evidence acquisition: On January 18, 2018, investigators searched PubMed, PsycInfo, SocIndex, Web of Science, Cochrane, and reference lists for English language RCTs involving pediatric health care and published between January 1, 1990, and December 31, 2017. Studies were included if they were (1) an RCT, (2) on a pediatric population, and (3) recruited or screened based on exposure to C-ACEs. Investigators extracted data about the study sample and recruitment strategy, C-ACEs, intervention and control conditions, intermediate and child outcomes, and significant associations reported.

Evidence synthesis: A total of 22 articles describing results of 20 RCTs were included. Parent mental illness/depression was the most common C-ACE measured, followed by parent alcohol or drug abuse, and domestic violence. Most interventions combined parenting education, social service referrals, and social support for families of children aged 0–5 years. Five of six studies that directly involved pediatric primary care practices improved outcomes, including three trials that involved screening for C-ACEs. Eight of 15 studies that measured child health outcomes, and 15 of 17 studies that assessed the parent–child relationship, demonstrated improvement.

Conclusions: Multicomponent interventions that utilize professionals to provide parenting education, mental health counseling, social service referrals, or social support can reduce the impact of C-ACEs on child behavioral/mental health problems and improve the parent–child relationship for children aged 0–5 years.

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CONTEXT

In 1998, Kaiser Permanente, in partnership with the Centers for Disease Control and Prevention, published one of the largest investigations of early life experiences and later life health outcomes.[1] This study surveyed adults about their adverse childhood experiences (ACEs), defined as exposure to child abuse (psychological, physical, or sexual), child neglect (emotional or physical), and household dysfunction (alcoholism, drug abuse, mental illness, domestic violence, incarceration, and divorced or separated parents). The initial and numerous follow-up studies demonstrated a graded relationship between the number of ACEs and later life risk for a range of poor health outcomes, including suicide, alcoholism, illicit drug use, depression, diabetes, heart disease, stroke, cancer, and premature mortality.[1–3] Additional studies showed that ACEs increase risk for poor health outcomes in

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childhood, including language delays, behavior problems, injuries, somatic complaints, and obesity.[4–6] Epidemiologic studies suggest that the majority of the adult population (approximately 60%) have experienced one or more ACEs, and that a significant proportion have experienced four or more ACEs (12%–20% with higher proportions in lower socioeconomic regions).[7,8] Given the prevalence of ACEs and the strong association with poor health outcomes, there is a need for interventions to prevent or mitigate the potentially negative impact of ACEs.

The American Academy of Pediatrics recommends that pediatricians screen for ACEs and develop innovative service-delivery adaptations to support children exposed to potentially toxic stressors.[9,10] From the perspective of good patient care, healthcare providers need to be aware of ACEs in order to inform medical decisions about treatment of symptoms. Additional evidence is not needed, for example, to know that in caring for a child with frequent stomachaches and headaches it is important to screen for domestic violence or harsh parenting as potentially contributing causes. However, secondary prevention by screening asymptomatic pediatric patients for exposure to ACEs measured in childhood (C-ACEs) in order to avoid or postpone poor outcomes associated with C-ACEs needs to be supported by what the U.S. Preventive Services Task Force calls a "chain of evidence."[11] This chain of evidence needs to include demonstration that primary care interventions can improve health outcomes for asymptomatic children exposed to ACEs.[12]

Since publication of the ACE study, there have been discrepancies in how adversity is defined in the scientific and secular literature, which reflects a lack of agreement about distinguishing different types of risk factors and how they work together. For this review, investigators chose to define adversity by using the same measures of child maltreatment and household dysfunction that were identified in the initial and follow-up ACE studies. One of the key findings of this literature is that ACEs represent a cluster of interpersonal risk factors, such that exposure to one ACE increases the likelihood of exposure to another ACE.[1] As shown in a theoretic framework (Figure 1), ACEs are distinct from social and intrapersonal risk factors. Investigators of this literature review hypothesize that the effect of ACEs on health outcomes is mediated by impact on the parent–child relationship, and therefore improving the parent–child relationship is a key target for interventions to prevent or reduce the impact of ACEs. This is an important insight into how healthcare providers may be able to help families impacted by ACEs, and is distinct from the need for healthcare providers to consider the impact of other social determinants.

Addressing social risk factors, such as childhood poverty, may contribute to the primary prevention of ACEs. Recent literature reviews have summarized best practices for addressing childhood poverty.[13–15] There are a number of clinic-based interventions that reduce the impact of childhood poverty, such as Reach Out and Read, Healthy Steps for Young Children, Medical–Legal Partnership, and Health Leads.[15] There are also public health programs, such as the Nurse–Family Partnership, that can be linked to pediatric practice and improve a range of outcomes for low-income families.[16] However, one of the key findings of the initial and follow-up ACE surveys is that ACEs are prevalent across socioeconomic strata,

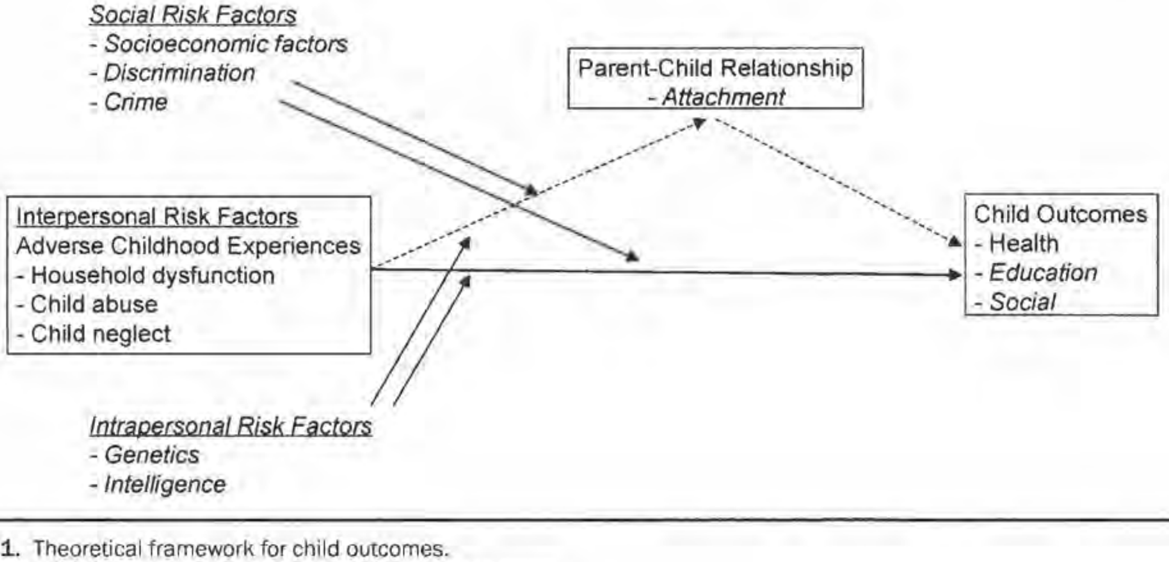


Figure 1. Theoretical framework for child outcomes.
Note: Italics indicate factors that are not a focus of this literature review.

and so reducing the public health impact of ACEs will require interventions that are applicable across socioeconomic strata. Furthermore, the presence or absence of ACEs may be key to explaining variability in health outcomes within socioeconomic strata. Therefore, it is critical to look specifically at the results of studies that have selected samples based upon ACEs in order to identify interventions that reduce the impact of ACEs.

In order to build the chain of evidence needed by pediatric primary care providers to support screening for C-ACEs, evidence is needed from studies of primary care screening to improve health outcomes for asymptomatic children exposed to ACEs. Given the paucity of such studies, and in order to inform the design of future screening studies, investigators of this literature review looked more broadly at RCTs of pediatric healthcare interventions to prevent poor outcomes associated with C-ACEs. The results of this systematic literature review provide a guide for pediatric healthcare providers and researchers regarding what is known and not known about how healthcare professionals can respond to C-ACEs.

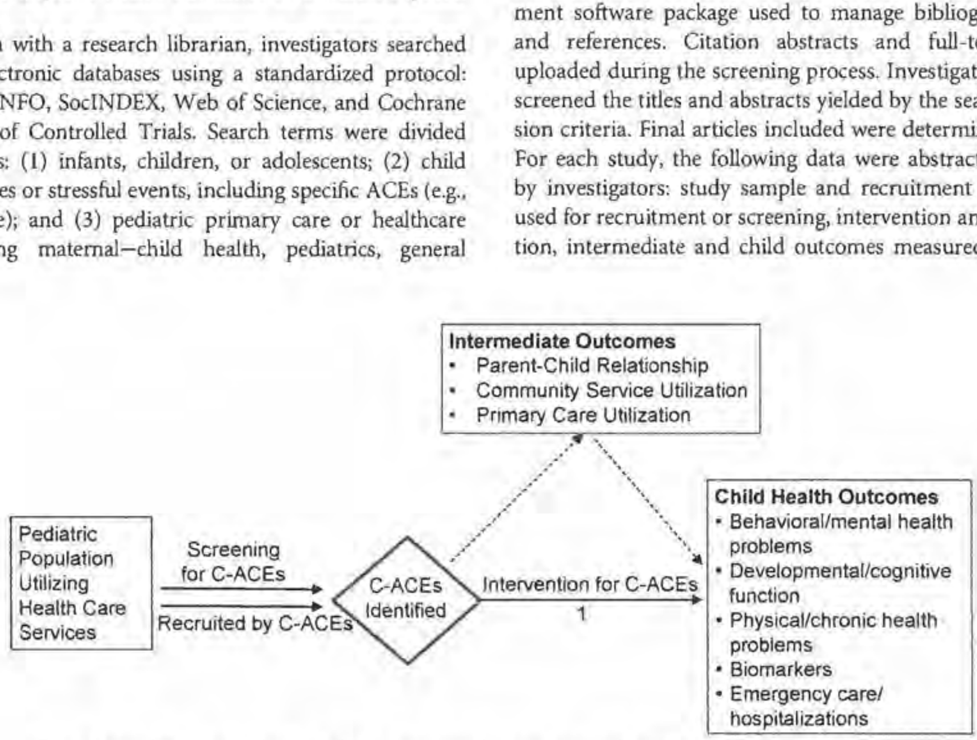
EVIDENCE ACQUISITION

The analytic framework used to guide this systematic review is shown in Figure 2. The key question was: what pediatric healthcare interventions improve health outcomes in children exposed to C-ACEs?

In conjunction with a research librarian, investigators searched the following electronic databases using a standardized protocol: MEDLINE, PsycINFO, SocINDEX, Web of Science, and Cochrane Central Register of Controlled Trials. Search terms were divided into three groups: (1) infants, children, or adolescents; (2) child adverse experiences or stressful events, including specific ACEs (e.g., domestic violence); and (3) pediatric primary care or healthcare services, including maternal–child health, pediatrics, general practice, and community health nursing. Between groups the Boolean phrase "AND" was used, and within groups the Boolean phrase "OR" was used. The following filters were applied when available: English, human, RCT, and publication date from January 1, 1990 to December 31, 2017. A detailed summary of the electronic search syntax is provided in the Appendix Table 1 (available online). In addition, investigators reviewed reference lists of included papers, summary articles, and personal libraries. Investigators also contacted the primary author of the included studies in order to identify additional potentially relevant published and unpublished studies.

The literature search was for studies of patients that accessed pediatric healthcare services through a maternal–child health, pediatric or general practice clinic, or through a community health nursing program. Studies were included if they (1) conducted an RCT design, (2) collected data on a pediatric population, and (3) recruited or screened that sample based on exposure to C-ACEs, where C-ACEs were defined as child exposure to maltreatment, domestic violence, a household member with depression or mental disorder, a household member with alcohol or drug abuse problem, incarceration of a household member, and divorced or separated parents. Because the key question was about the efficacy of interventions to address C-ACEs, the investigators included both studies that screened pediatric patients for C-ACEs and studies that recruited pediatric patients based upon exposure to C-ACEs. Both approaches used defined criteria to identify C-ACEs (screening studies used a parent-report tool; other studies used a combination of parent report, structured interviews, or medical records). Both approaches evaluated the efficacy of interventions to improve outcomes for pediatric patients after identifying C-ACEs.

Literature search results were uploaded to EndNote, a management software package used to manage bibliographies, citations, and references. Citation abstracts and full-text articles were uploaded during the screening process. Investigators independently screened the titles and abstracts yielded by the search against inclusion criteria. Final articles included were determined by consensus. For each study, the following data were abstracted independently by investigators: study sample and recruitment strategy, C-ACEs used for recruitment or screening, intervention and control description, intermediate and child outcomes measured, and statistically



1. Key Question: What pediatric health care interventions improve health outcomes in children exposed to C-ACEs (Child-Adverse Childhood Experiences)?

Figure 2. Analytical framework for systematic review.

significant associations reported. For child health outcomes, investigators looked for behavioral or mental health problems, developmental or cognitive functioning, physical or chronic health problems, child biomarkers (such as blood pressure or cortisol levels), and emergency or hospital utilization.

Investigators defined intermediate outcomes as factors that might be associated with C-ACEs and influence the likelihood of poor child health outcomes. These included changes in parent risk factors (e.g., parent depression), as well as community service utilization (e.g., referrals for psychosocial needs) and primary care utilization (e.g., immunizations). Investigators also categorized measures of the parent–child relationship, including child maltreatment, as intermediate outcomes. Child maltreatment was defined as child physical, emotional, or sexual abuse, as well as child physical or emotional neglect. Actual measures of child maltreatment used by each study are shown in Appendix Table 2 (available online). Although child maltreatment could have been categorized as a child health outcome, the investigators chose to categorize it as an intermediate outcome because the measures of child maltreatment did not always provide sufficient information to determine the impact on the child's health. For example, a reduction in Child Protective Service (CPS) reports may or may not have meant a reduction in child health problems. By considering child maltreatment measures as intermediate outcomes, the investigators were able to identify studies that demonstrated an impact on child behavioral, developmental, or physical outcomes.

Reviewers outlined the key information and findings from each study in a table format. Studies were divided into two major categories: (1) those that directly involved a pediatric primary care provider, and (2) those that did not involve a pediatric primary care provider but did involve pediatric healthcare services. Studies were also subcategorized by impact on child health outcomes, impact on intermediate outcomes only, and no impact. For each study, an intervention intensity was assigned as follows: high-intensity interventions were multicomponent interventions including home visits that extended over 3–5 years, medium-intensity interventions were multicomponent interventions that included home visits or multiple follow-up visits over 4–18 months, and low-intensity interventions targeted at least one component (e.g., parenting, social services) and included up to seven follow-up assessments. Data analysis focused on contrasting and comparing methods and findings across studies. Because of the heterogeneity of measures, a meta-analysis was not feasible.

EVIDENCE SYNTHESIS

The initial electronic search identified 2,044 potentially relevant articles after excluding duplicates. Figure 3 illustrates a flowchart of the article selection following PRISMA guidelines.[17] After review for study criteria, a total of 22 articles describing results of 20 RCTs were kept for inclusion. All included studies were evaluated by both reviewers using the U.S. Preventive Services Task Force quality rating guidelines[18] and findings were consistent with a related previous review by the U.S. Preventive Services Task Force.[19] Specifically, two studies were evaluated as good quality[20,21] and the remainder were identified as fair quality.

Appendix Table 2 (available online) divides the literature review results into "studies that directly involved a pediatric primary care provider" and "studies that did not directly involve a pediatric primary care provider but did involve pediatric healthcare services." Within each of these categories, studies are further divided into those that improved child health outcomes, those that improved intermediate outcomes only, and those that did not improve child health or intermediate outcomes. Individual studies are presented in order from highest- to lowest-intensity intervention.

General Results

Appendix Table 2 (available online) lists the types of C-ACEs used by each study for subject selection or screening. Parent mental illness/depression was the most common C-ACE measured (16 studies), followed by parent alcohol or drug abuse (15 studies) and domestic violence (12 studies). Studies varied in the identification of subjects from one C-ACE[22–27] to five C-ACEs.[28–33]

The majority of studies collected data on infants and children up to age 5 years, but three studies included older children.[25,32,34] Most studies combined parenting education, social service referrals, and social support as intervention components. Six studies utilized mental health professionals for counseling or therapy.[20,24,26,27,35,36]

A range of measures were used to assess child health outcomes, including parent report using structured instruments for child psychosocial symptoms, parent report by interview, medical records, and professional assessment of child development. None of the identified studies measured child biomarkers. A range of measures were used to assess intermediate outcomes, including parent report about relationships, professional observations of the parent–child relationship, CPS and medical record reports of child maltreatment, parent report of mental health symptoms, stress or drug use, professional observations of the home environment, and parent and medical record reports about use of pediatric services.

Intervention intensity by itself did not guarantee efficacy. That is, investigators found examples of low-intensity interventions that demonstrated a significant impact on child health outcomes,[37] as well as examples of high-intensity interventions with limited impact.[30] However, larger effect sizes were observed for medium- to high-intensity interventions.

Results for Studies That Involved a Pediatric Primary Care Provider

Six interventions directly involved pediatric primary care practices, of which two were medium intensity[20,22]

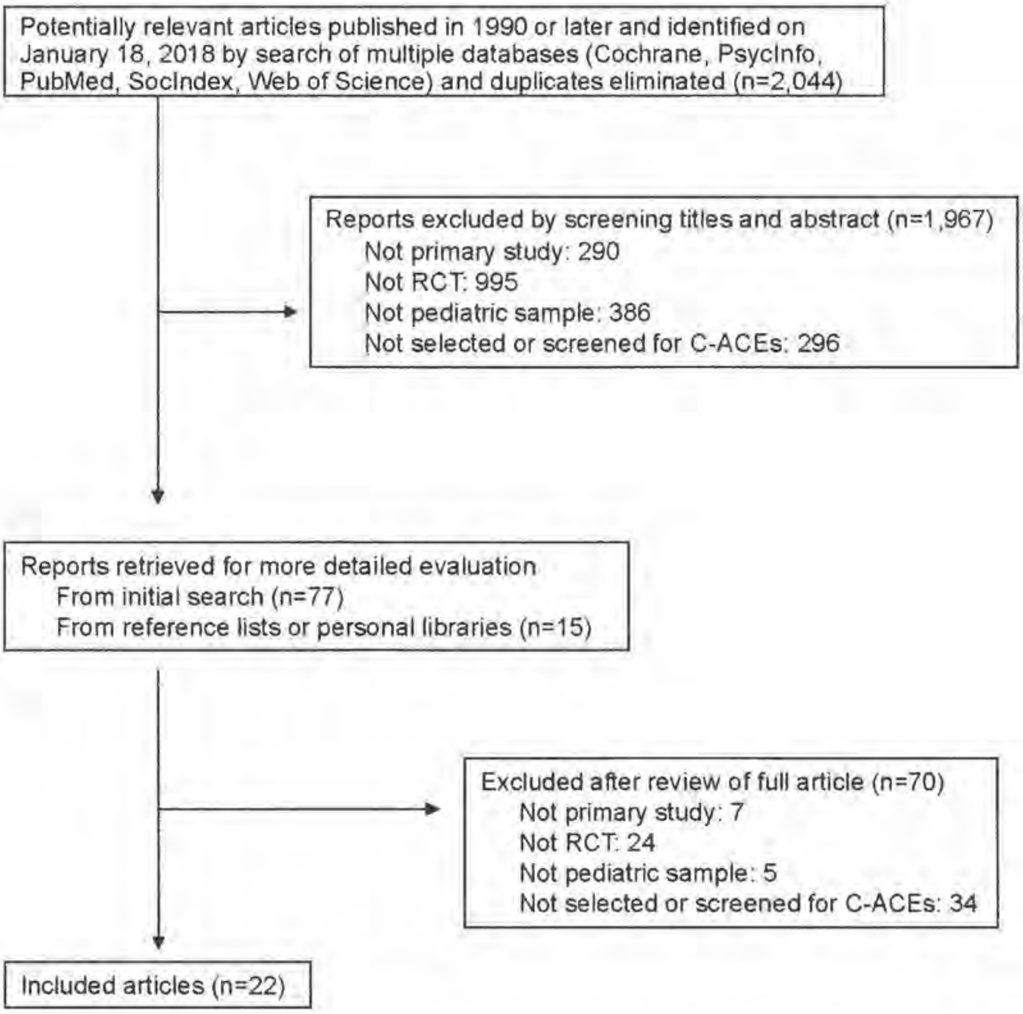


Figure 3. Flow diagram of inclusion and exclusion criteria.
C-ACEs, child adverse childhood experiences.

and four were low intensity.[21,34,38,39] One of the three studies that measured child health outcomes included mental health treatment and demonstrated a reduction in infant bruising.[20] The three trials that involved screening for C-ACEs did not measure child health outcomes as defined in this review, but did reduce CPS reports,[38] reduced psychological aggression,[39] and increased community resource utilization.[34] One study of the comparability of group well-child care to individualized well-child care did not improve child health or intermediate outcomes.[21]

Results for Studies That Involved Other Pediatric Healthcare Services

Fourteen interventions did not involve a pediatric primary care provider, but did include other pediatric healthcare services and, of these, four were high intensity,[29-33] one was low intensity,[37] and the remainder were medium intensity. Seven of 12 studies that measured child health outcomes (such as child behavior problems, developmental delays, injuries, and illnesses) demonstrated a statistically significant improvement.[20,23,24,26,28,32,36,37] Six of seven studies that used a structured instrument for child psychosocial symptoms demonstrated a reduction in child behavioral/mental health problems.[23,24,26,32,33,36,37] One of four studies that measured child development demonstrated improvement.[36] The largest effect sizes were observed for multifactorial medium- to high-intensity interventions that utilized professionals and measured outcomes in children aged 1−5 years.[23,32,33,36] Studies that included a mental health treatment component demonstrated improvements in child health outcomes,[20,24,26,36] except for one study that measured child development only[35] and one pilot trial with inadequate power.[27] One high-intensity home-visiting model reduced hospital or emergency utilization.[32,33]

With regard to intermediate outcomes, 12 of 14 studies that assessed the parent−child relationship demonstrated improvements. These improvements included more positive parenting, reduced harsh punishment, improved mother−child interactions, and increased maternal sensitivity. Four studies assessed impact on CPS reports: three used paraprofessionals and did not impact CPS reports,[29−31] one used professionals and did reduce CPS reports.[36] Only one study evaluated mediation by the parent−child relationship, and this study found that decreased child behavior problems were mediated by increased positive behavioral support from the parent.[37]

Two studies did not improve child health or intermediate outcomes: one was attempting to prevent the recurrence rather than the incidence of poor child outcomes in a sample of families with one index child exposed to physical abuse or neglect,[25] and another was a pilot study.[27]

DISCUSSION

This systematic literature review evaluated current evidence for pediatric healthcare interventions that can improve outcomes for children exposed to C-ACEs. The results suggest that multicomponent medium- to high-intensity interventions that utilize professionals can reduce child behavioral/mental health problems associated with exposure to C-ACEs and improve parent−child relationships for children aged 1−5 years. For example, Lowell and colleagues[36] utilized mental health clinicians to provide a two-generation intervention that involved home visits over a year for parents of children aged 6−36 months, and included connection to community-based services, as well as parenting education based upon parental need. In another successful intervention by Butz et al.,[23] community health nurses provided home visits over 18 months for toddlers aged 24−36 months, and included parenting curriculum according to parental need. All of the studies that improved child health outcomes included parenting education, mental health counseling, or both, and all but one delivered services via home visits (the one exception was by Dishion and colleagues,[37] who used home visits for the initial and follow-up evaluations only). Studies that measured but did not impact child health outcomes were delivered by paraprofessionals, which is consistent with other studies that have found greater efficacy for home-visitation programs that utilize staff with graduate-level training.[40]

The results of this review can help guide innovation in pediatric primary care practice. The number of C-ACEs identified varied across studies and did not appear to have a clear relationship to intervention efficacy, which may be because of the clustering of ACEs.[1] That is, it may be that the identification of any C-ACEs during pediatric primary care screening is more important than the number of C-ACEs identified. The three studies that involved pediatric primary care screening for C-ACEs were low intensity. Despite being low intensity, the two trials that included parenting education along with social service referrals demonstrated an improvement in the parent−child relationship.[38,39] Findings from the broader literature included in this review suggest that pediatric primary care interventions may be able to significantly impact child outcomes if including expanded education about child development and parenting skills along with social support for the parent. The value of having the pediatric primary care provider incorporate parenting education and social support into well-child care is that it directly addresses the impact of C-ACEs on the parent−child relationship, underscores the importance of relationships to health promotion, and is consistent with a two-generation model of pediatric care.[41] Of note, none of the studies that directly involved a pediatric primary care provider were evaluated as high intensity due to lack of a home-visiting component or short duration, or both. Findings from this review suggest that longitudinal primary care−public health partnerships that integrate use of nurse home visitors and mental health professionals into interdisciplinary care teams are needed to have the largest effect on child health outcomes, especially outcomes that are challenging to impact, such as child developmental delays. Lastly, pediatric researchers should note the importance of measuring the parent−child relationship and child psychosocial symptoms in order to enable evaluating mechanisms and impact of pediatric primary care interventions.

Several gaps in the literature were apparent from this literature review. Only three studies involved pediatric primary care screening, which indicates a need for more studies of asymptomatic patients in order to determine whether screening for C-ACEs can reduce poor outcomes associated with C-ACEs. There were very few studies on children aged 6 years and older. Only one study examined potential mediators in order to help identify effective components of the intervention. There were no trials that measured child biomarkers that could be used to assess the efficacy of a pediatric intervention and a potential link to adult health outcomes. In addition, although mental illness/depression was the most commonly identified C-ACE used to select subjects in the included studies, and substance use disorder was the second most common C-ACE used for selection, none of the trials included parent substance use disorder treatment as a core intervention component, and only a few studies included parent mental health treatment.

The dearth of evidence on a family-based approached to pediatric practice is disappointing, given prior reports highlighting the importance of family functioning to child health.[42] There is evidence that treating maternal depression reduces symptoms in children.[43] There is also evidence that interventions for parents with mental health problems do not have to be elaborate or intensive to impact child health. For example, Beardslee et al.[44] showed that a brief, clinician-based intervention including child assessment and a family meeting reduced internalizing symptoms for parents with mood disorders and their children up to 4.5 years after the intervention, along with improving parental child-related behaviors and child-reported understanding of parental mood disorder. Both the American Academy of Pediatrics and the American Academy of Child and Adolescent Psychiatry support developing models of integrated behavioral health services for pediatric patients,[45] which is important for treating children with symptoms of traumatic stress. However, for prevention, such integrated behavioral health service models would optimally include adult mental health and substance use treatment programs, as well as mental health-promotion programs for pediatric patients.

This literature review was intentionally limited to RCTs that screened or recruited based upon exposure to C-ACEs. Some potentially effective pediatric interventions were not included in this review because the studies did not select samples based upon child exposure to ACEs. For example, Nurse-Family Partnership[46] and Healthy Steps[47] have been shown to be effective for low-income patients and may show higher efficacy for low-income children exposed to ACEs. A recent quasi-experimental study in a low-income sample supports this hypothesis based upon mother's exposure to ACEs. Specifically, this study showed that children of mothers with childhood trauma had worse socioemotional scores than children of mothers without childhood trauma, but that participation in Healthy Steps had the greatest impact for children of mothers with childhood trauma.[48] In other words, parent or child exposure to ACEs may be useful for determining which low-income children may benefit most from an intervention. Recent studies corroborate the potential utility of screening for parent ACEs in order to identify high-risk families and implement early intervention to prevent poor developmental outcomes,[49,50] and demonstrate feasibility of screening for parent ACEs in pediatric practice.[51]

Limitations

Like other systematic literature reviews, findings from this study may be influenced by publication bias or the tendency for studies without a significant result to be unpublished. Investigators attempted to reduce this bias by contacting the primary author of included studies to request unpublished results. Nonetheless, results of this review may be skewed toward interventions that demonstrated improvements in child health or the parent −child relationship.

CONCLUSIONS

This paper adds to other reviews of studies to prevent child maltreatment[19] by considering a specifically high-risk population because of exposure to C-ACEs, a broader range of child outcomes, and a detailed analysis of intervention components to help guide clinicians and researchers. The greatest support was found for the feasibility of reducing child behavioral/mental health problems and improving the parent−child relationship for children aged 1−5 years. Multicomponent medium- to high-intensity interventions that utilized professional home visitors to provide parenting education or mental health counseling demonstrated the largest effects. Investigators found a relative lack of studies that involved screening for C-ACEs by pediatric primary care providers. Investigators also found a relative lack of studies that included children ages 6 years and older, evaluated potential mediators, measured child biomarkers, and incorporated parent mental health or substance use counseling. Future research is recommended to evaluate the impact of pediatric primary care screening and referral for C-ACEs, and the integration of additional intervention components into pediatric practice, including expanded parenting education, expanded social support for families, integration of behavioral health services for both parents and children, and linkages to home-visiting programs.

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SUPPLEMENTAL MATERIAL

Supplemental materials associated with this article can be found in the online version at https://doi.org/10.1016/j.amepre.2018.11.030.

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ATTACHMENT RB-17

This is the attachment marked '**RB-17**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

Emergency Psychiatry in the General Hospital

The emergency room is the interface between community and health care institution. Whether through outreach or in-hospital service, the psychiatric crisis team in the general hospital must have specialized skill and knowledge to attend the increased numbers of mentally ill, substance abusers, homeless individuals, and those with greater acuity and comorbidity than previously known. This Special Section will address those overlapping aspects of psychiatry, medicine, neurology, psychopharmacology, and psychology of essential interest to the psychiatrist who provides emergency consultation and treatment to the general hospital population.

A Survey of Psychiatric Consultations at a Suburban Emergency Room

Louise Amanda Stebbins, R.N.,M.S.N.,C.S. and
George Lynn Hardman, M.D.

Abstract: *The utilization of psychiatric crisis teams in urban hospitals is well documented. However, little is reported describing patients who use crisis teams in suburban general hospital emergency rooms. This is a descriptive survey of 1707 suburban patient visits. This study relates patient demographics with the length of time required to provide crisis intervention and disposition. A regression model is used to analyze the duration of service time and utilization patterns in relation to eight variables: season, month, day, shift, diagnosis, method of payment, age, and disposition. Five predictors are identified as significantly relating to the duration of the psychiatric consultation process. These predictors may enable hospital administrators and medical staff to plan and implement psychiatric emergency room care.*

Introduction

Increased use of emergency departments (ED) brought about by a growing number of either uninsured, or under-insured, sicker patients, particularly the elderly, has overloaded emergency medical care systems. The American Hospital Association estimated a record 89.7 million ED visits in 1989 with a continual growth rate of 3.57% [1]. Because U.S. emergency departments have been mandated by both state and federal legislation to provide a medical screening examination for all patients who present themselves for care, the ED has become the only "guaranteed" access point to the U.S. health care system [2]. It seems prudent to study utilization patterns of patient subsets to develop clinical practice guidelines that are cost-effective. Dr. Strange et al. [1] and Singal et al. [3] have reported on ED use by geriatric and younger patients. Dr. Ellison et al. have provided an extensive review of psychiatric patient service needs in the urban hospital ED [4]. Many urban studies attribute the increased use of psychiatric emergency teams to several psychosocial and economic factors rather than to an increase in true emergencies [5,6]. Factors such as an increase in the number of elderly, as well as a decrease in physician availability, patient education, economics, and convenience are identified [7]. Access to psychiatric care has become increasingly limited to the ED (available 24 hours a day), allowing patients employed during the day to obtain treatment without jeopardizing pay [8]. Kresler et al. [9] suggest that the increased use of psychiatric services in the ED reflects a better informed population regarding mental health and is also a response to a mobile society in which previous personal supports are no longer available. Finally, the ED has become a central place for prioritizing psychiatric care for third-party payors and evaluating patients for involuntary treatment.

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Gail Barton [10] has outlined the American Psychiatric Association task force's proposed "Guidelines for Psychiatric Care in Emergency Departments." Certification as a basic, general, and comprehensive emergency service is determined by the degree of compliance with 37 proposed "Guidelines." These guidelines attempt to establish a standard of care that should improve clinical practice. Standards of care may also identify redundant services and reduce health care costs. Psychiatric services are routinely billed on units of time. Factors thought to increase consultation time are those that retard disposition planning such as homelessness, medical complications, inadequate financial resources, and limited outpatient treatment programs [11]. Other factors thought to relate to the team's utilization are: season, month, day, and time of consultation. The patient's diagnosis and age may also relate significantly to the duration of the consultation process. Finally, the eight independent variables selected for this survey were based in part on previous findings in the literature [12–14].

This paper presents a descriptive survey of suburban patients seeking emergency room psychiatric consultations. Are there statistically significant predictors that allow suburban general hospital administrators and medical staff to plan and implement cost-effective psychiatric crisis teams?

Method

A retrospective review of 1707 ER psychiatric consultations, July 1, 1988–June 30, 1989, was conducted. Regression analysis was used to relate eight independent variables—season, month, day, shift, diagnosis, age, method of payment, and disposition—to the dependent variable, the duration of consultation process. By determining predictors that significantly relate to the duration of the consultation process, assumptions concerning resource allocation may be made that have impact on policy issues in emergency room care.

The hospital in this study is the Newton-Wellesley Hospital in Newton, Massachusetts. Psychiatric services are provided to a combined population of 288,000 patients consisting of residents from four towns of upper socioeconomic status (with a median household income of $57,000), five colleges, and the membership of two health maintenance organizations with whom the psychiatric department holds contracts to provide emergency psychiatric treatment. Psychiatric evaluation, intervention, and disposition planning are completed by members of an interdisciplinary crisis team comprised of psychiatrists, certified psychiatric nurse clinical specialists, licensed clinical social workers, and psychologists, all trained in emergency psychiatry and policies of managed health care providers. The model of crisis intervention described by Kercher [15] is employed as follows: On weekday shifts, clinicians gather basic information and assess the patient's mental status, develop an understanding of the crisis, confer with supervising psychiatrists, and obtain crisis resolution and disposition with patients and significant others. The team is exclusively scheduled to cover the emergency room Monday through Friday 8 AM–10 PM. Attending psychiatrists are assigned throughout the day shift to cover the emergency room. A psychiatrist resides at the hospital (5 PM–8 AM). He is available for consultation to the emergency and medical departments, and services the two inpatient psychiatric units. Patients with mental health emergencies are referred to the crisis team by a number of sources: emergency room physicians, attending hospital medical staff, psychiatric clinicians, clergy, police, insurance service providers, school counselors, other hospitals, and self referrals. A joint venture with an independent, mobile, community-based crisis team provides home-based intervention to residents from the four towns. Should the safety of the community or one of its members be in question, the individual in crisis is brought to the hospital for further assessment. In the ED, the patient is first seen by a triage nurse; vital signs are taken, recorded, and patients are questioned as to their medications, symptoms, and suicidal thoughts. Security personnel are called as needed.

To determine the existence of predictors that relate to the duration of the consultation process, we began by identifying the cumulative frequencies of subgroups within the eight independent variables to insure a sufficient sample size to detect differences among the subgroups. Variables thought to relate to the duration of the consultation process were diagnosis, age, method of payment, disposition, season, month, day, and shift. The duration of the consultation process was set at the commencement of the consultation and terminated at the time of patient discharge from the ED.

Using the Statistical Analysis System (SAS Institute Inc., Cory, N.C.), a weighted least-squares regression model was created to assess the eight variables in relation to the dependent variable, the duration of consultation process. Data were ob-

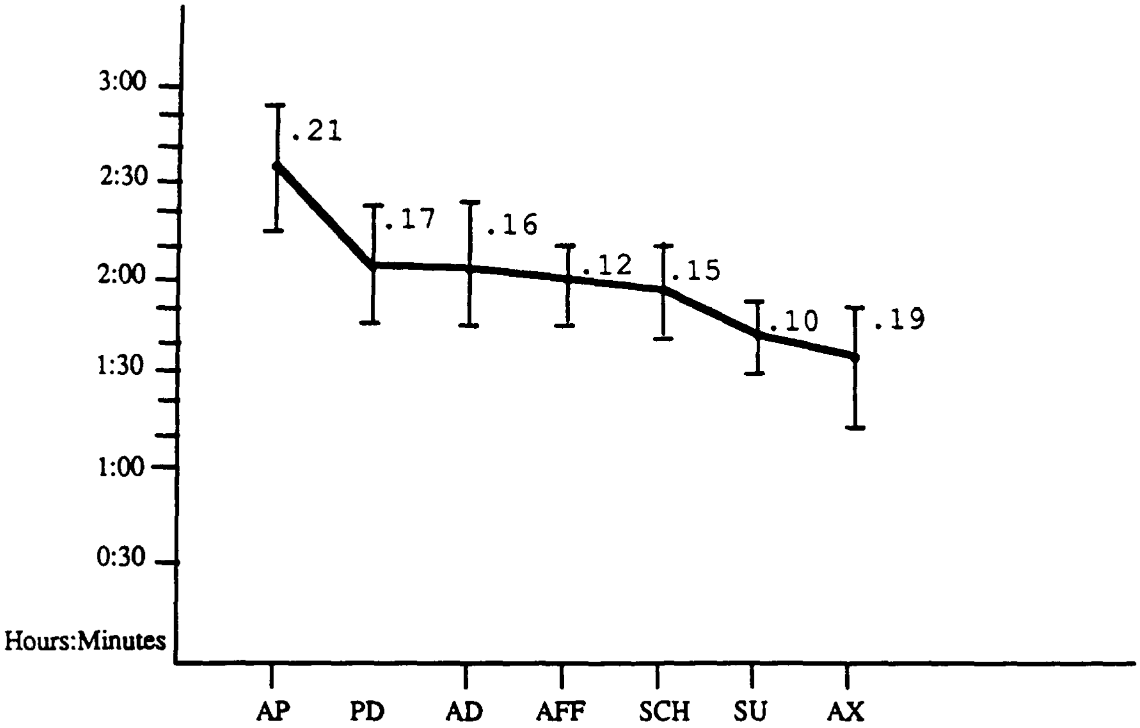


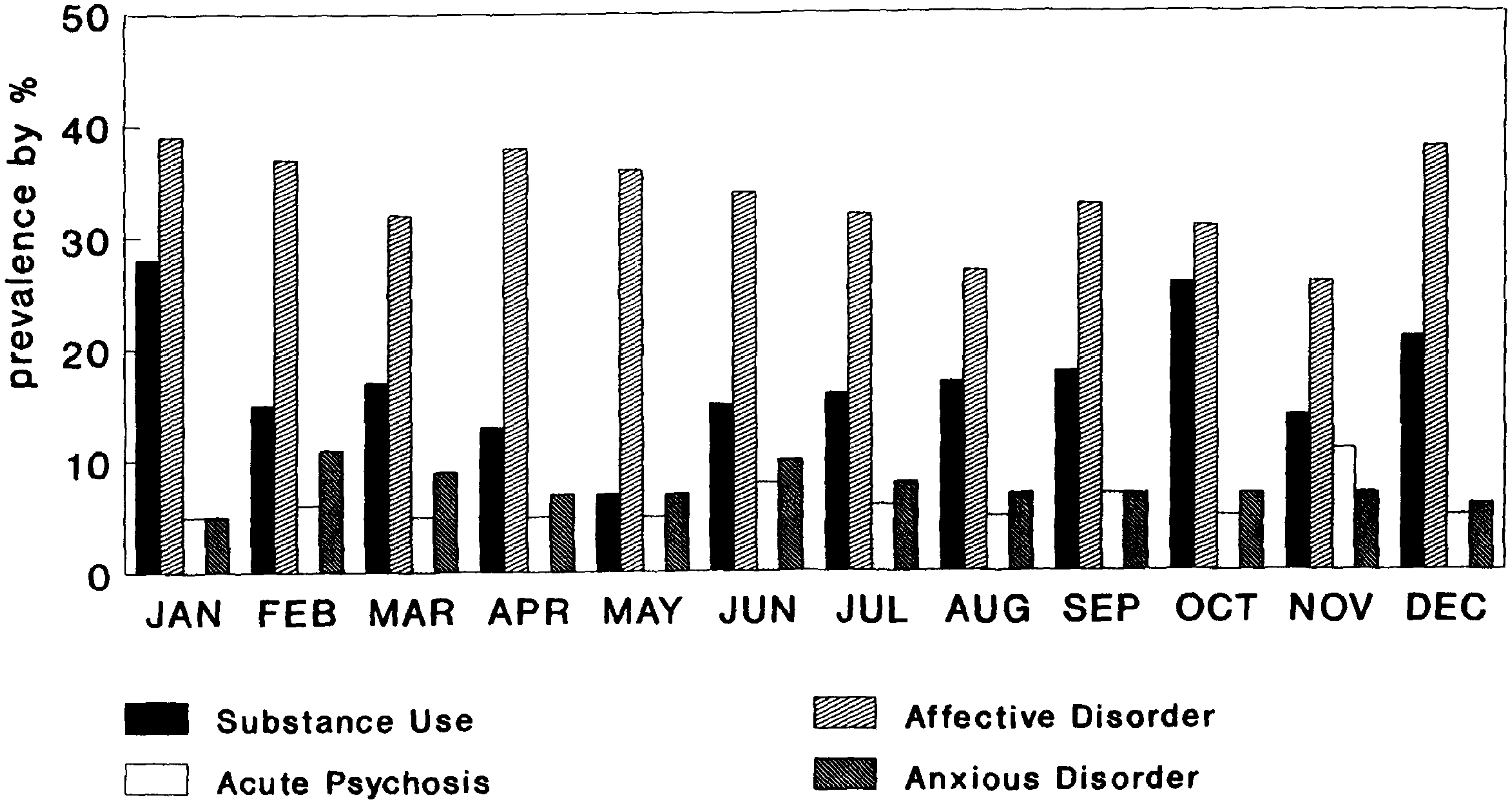
Figure 1. Diagnosis as a predictor of the duration of the consultation process. AP = Acute Psychosis, PD = Personality Disorder, AD = Adjustment Disorder, AFF = Affective/Mood Disorder, SCH = Schizophrenia, SU = Substance Use, AX = Anxious Disorder.

tained from the emergency room log book and categorized. Nine fields of data were entered: duration of consultation process, time consultation commenced identified by shift (one, two, or three), day, season, month, DSM-111-R diagnostic grouping, method of payment, disposition, and age. Data on each of the 1707 contacts were entered according to patient number; date; shift one (8 AM–5 PM), shift two (5 PM–10 PM), shift three (10 PM–8 AM); duration of consultation process (recorded in half hour increments); age groupings (child-3–11 years, adolescent-12–17 years, adult-18–64 years, and elderly-65 years and older). Should DSM-III-R criteria be met, the presenting diagnosis was recorded. Only one diagnosis for each patient was recorded. Methods of payment were indemnity insurance such as Blue Cross and Blue Shield, Medicaid, Medicare, health maintenance organization (HMO) insurance, and self-pay or no insurance. Disposition options were medical or psychiatric hospitalization, respite care, ambulatory psychiatric treatment, discharge to court, refer to shelter, and no psychiatric follow-up.

Results

Of all the patients who came to our ED, 5% were referred for psychiatric consultations. The total number of psychiatric consultations for the year was 1707, and 83% of the 1707 were new visits, with the remaining 17% being repeat visits. Patients treated in our aftercare clinic represent 22% of the 1707 and are considered priority clients by the State Department of Mental Health because they have major mental illness, have had or are at risk for having repeated psychiatric hospitalizations, and because they demonstrate serious functional impairment. Patients with four or more visits during the year represented only 2% of the 1707 visits. The average time range for the duration of consultation process was 1–2½ hours.

Types of diagnostic disorders that were present in at least 5% of the patients included schizophrenic, mood, adjustment, anxiety, personality, substance use, and acute psychosis. Duration of the consultation process varies significantly with the seven diagnostic groups ($p = 0.001$; Figure 1). Psychiatric disorders were recorded in 91% of the patient visits. The diagnostic distribution was as follows: mood 31% (521); substance use 16% (279); schizophrenia 13% (228); adjustment 11% (182); personality 8% (139); anxiety 7% (113); and acute


prevalence by %
50
40
30
20
10
0
JAN
FEB
MAR
APR
MAY
JUN
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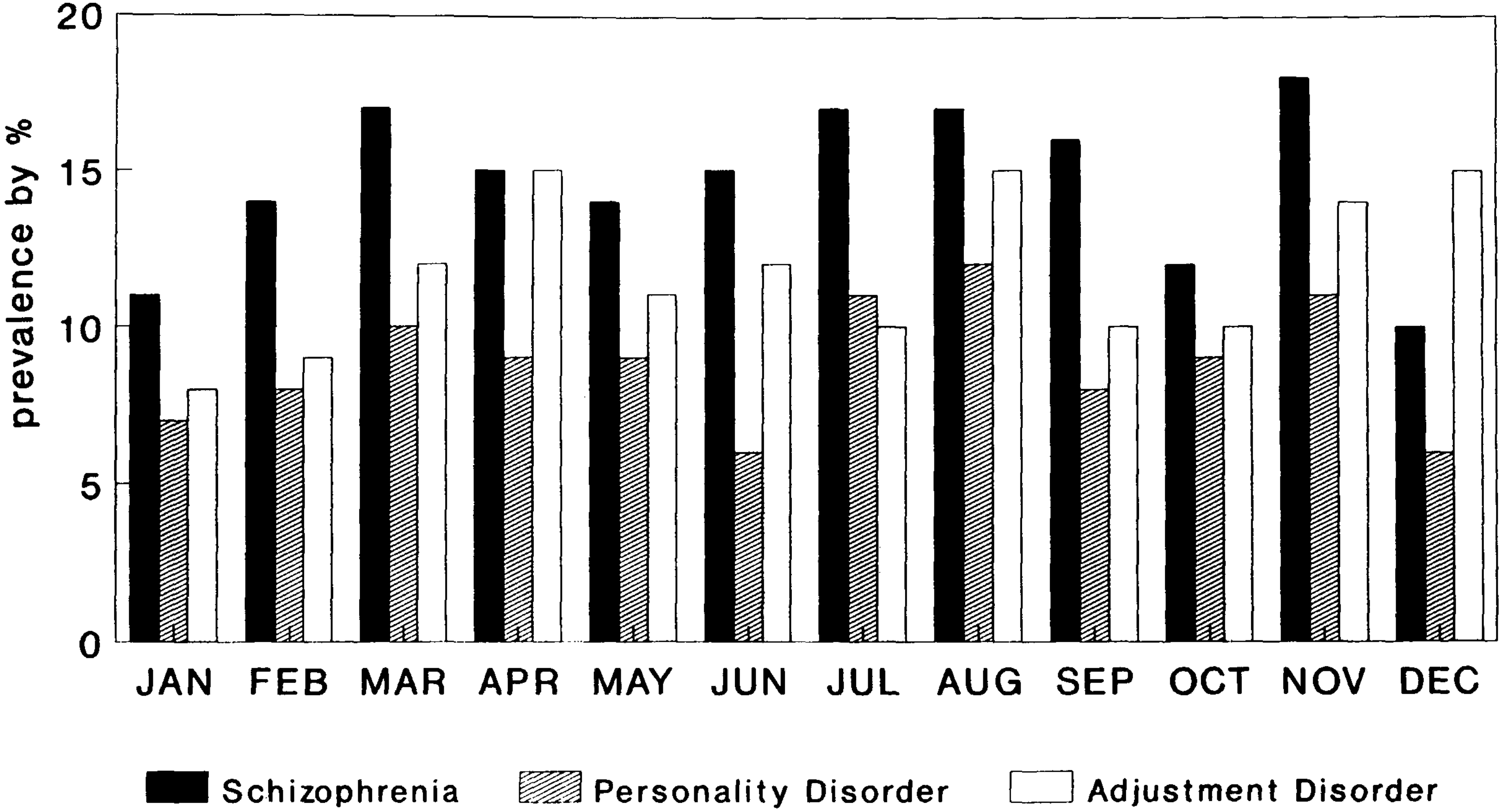
AUG
SEP
OCT
NOV
DEC
Substance Use
Affective Disorder
Acute Psychosis
Anxious Disorder


prevalence by %
20
15
10
5
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JAN
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SEP
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DEC
Schizophrenia
Personality Disorder
Adjustment Disorder

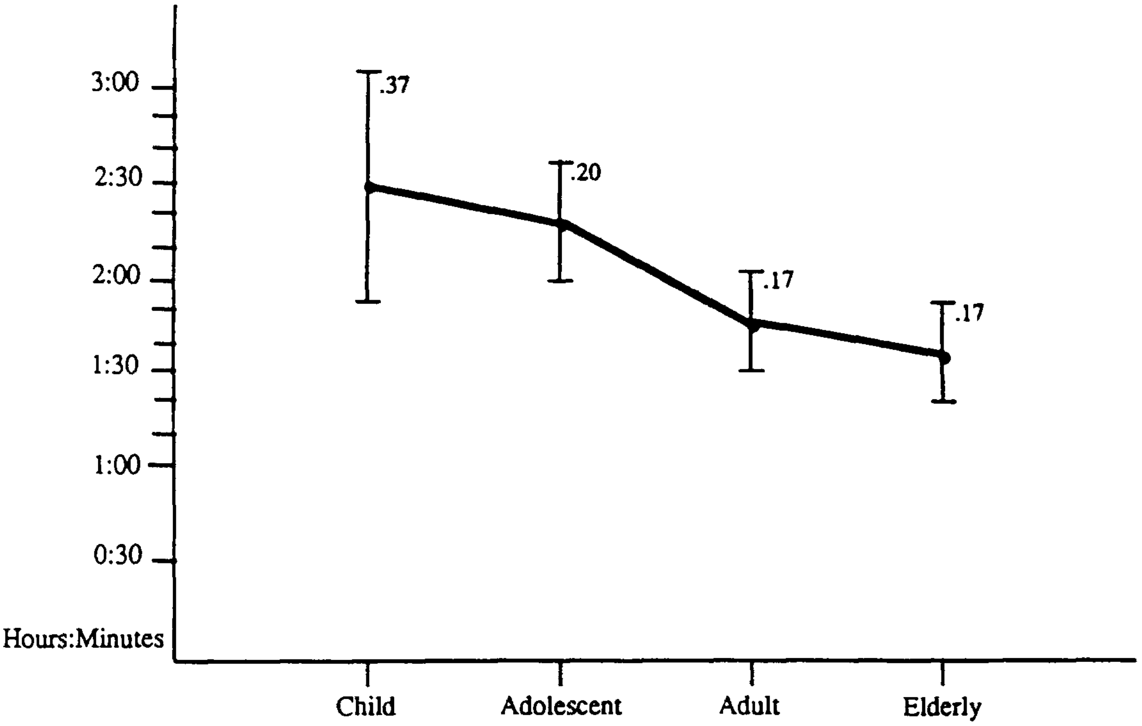

Figure 4. Age as a predictor of the duration of the consultation process.

psychosis 5% (86). Figures 2 and 3 highlight the distribution of diagnostic prevalence for the 12 months. Please note that the Y axis for Figure 2 is 0%–50%, and for Figure 3 it is 0%–20%. The number of patients varied each month, as did their range of diagnoses. However, mood disorders were consistently the most prevalent, often representing at least 30% of the patients seen in a given month. Substance use was prevalent in at least 20% of the patients in January, October, and December. Patients diagnosed with acute psychosis represented 11% of the consultations in November, and at least 5% in the 11 remaining months. Anxiety was prevalent in February (11%), and in June (10%). Schizophrenia was diagnosed in at least 17% of our patients in November, March, July, and August. Personality disorders were diagnosed in 12% of our patients in August. Patients diagnosed with adjustment disorders represented at least 14% of the consultations in April, August, November, and December. January, March, April, and May represented above-average use of our service.

Age significantly predicts the duration of the consultation process ($p = 0.001$). Adolescents take longer to consult than all other groups. As each group increases with age, the duration of the consultation process decreases (Figure 4). The age distribution among patients was as follows: adults 76%; adolescents 16%; elderly 6%; child 2%.[1]

The majority of our patients, 57%, were hospitalized either for medical or psychiatric reasons, and 34% were referred for ambulatory psychiatric treatment. Among those hospitalized, 28% were admitted to Newton-Wellesley Hospital, and 62% were transferred elsewhere. The disposition outcome relates significantly with the duration of the consultation process ($p = 0.0001$; Figure 5).

When the method of payment is added to the model consisting of diagnosis, shift, day, age, and disposition, it does not predict *duration* of the consultation process ($p = 0.1326$), which varies significantly according to the day of the week ($p = 0.0056$), and shift ($p = 0.001$). Table 1 highlights the annual distribution of psychiatric emergency team utilization, isolated by shift and day. Holidays were omitted from further analysis because the sample size was too small. Shift one (8 AM–5 PM) provided 48% of the consultations. Shift two (5 PM–10 PM) provided 32% of the consultations, and shift three (10 PM–8 AM) provided 20% of the consultations. Wednesday, Thursday, and Friday were days with above-average use of the psychiatric cri-

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[1] Sample size was too small and was found not to be significant.

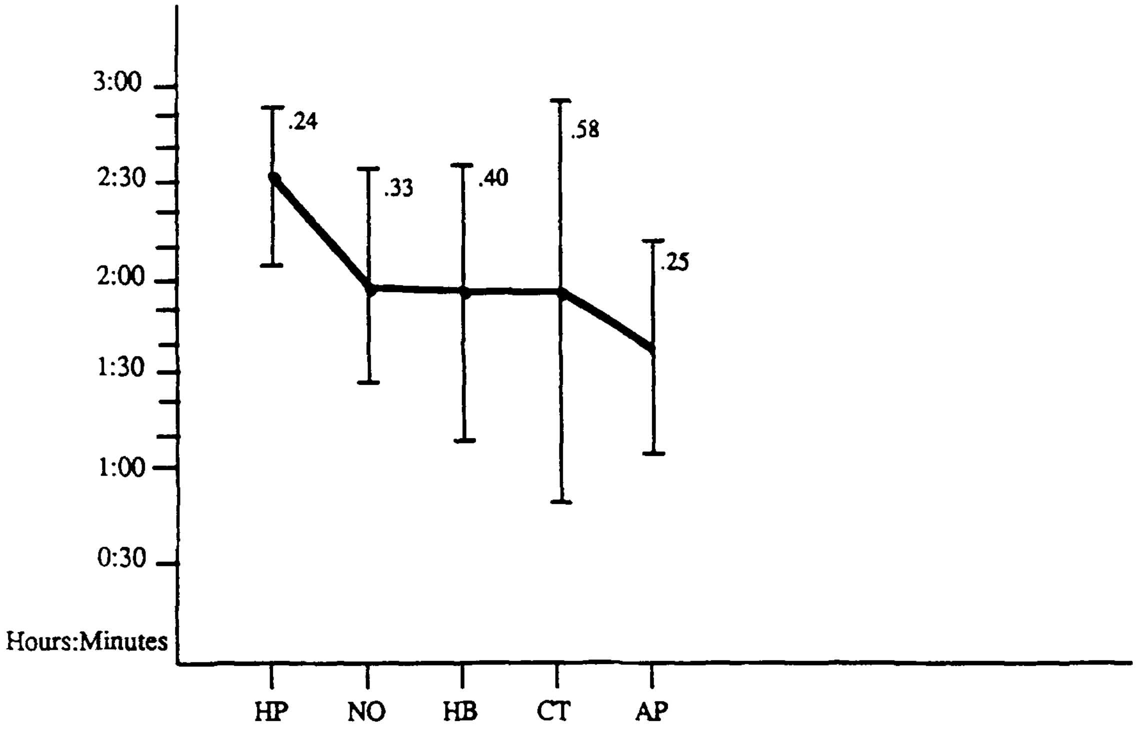

Figure 5. Disposition as a predictor of the duration of the consulation process. HP = hospitalization, NO = no psychiatric follow-up, HB = holding bed, CT = court transfer, AP = ambulatory psychiatry/outpatient follow-up.

sis team. Shift three was particularly busy on Saturday and Sunday.

Discussion

The survey's statistical analysis supports three major conclusions. First, the utilization of the psychiatric emergency team varies somewhat on all three shifts 7 days of the week, and does not allow for tight scheduling of personnel and space. The need for the team is erratic; under- and over-utilization are standard. To illustrate the variation in utilization, one may anticipate the team's involvement with the consultation process on Wednesday, a day with high utilization, to be frantic or manageable, depending on the patient's time of arrival, diagnosis, age, and disposition. For example, a longer time will be allocated to the consultation process when treating an acutely psychotic adolescent than to treating an anxious elderly patient who presents on the same day, during the same shift. Addressing each of the variables that were found to be predictors—day, shift, diagnosis, age, and disposition—the duration of the consultation process may range from 1 hour and 30 minutes to 2 hours and 40 minutes. This range represents an approximation of the means for each of the predictors. An acutely psychotic adolescent is confused and often is accompanied by police, college personnel, or distraught relatives from whom a concise history and

Table 1. Psychiatric emergency team utilization (by %) according to shift and day for 1 year

	Shift one 48.5% (*N* = 828)	Shift two 31.79% (*N* = 541)	Shift three 19.8% (*N* = 338)
Sunday 11.3% (*N* = 193)	10%	10%	17%
Monday 13.2% (*N* = 226)	12%	15%	14%
Tuesday 13.9% (*N* = 237)	14%	16%	10%
Wednesday 16.1% (*N* = 275)	16%	14%	16%
Thursday 15.2% (*N* = 259)	17%	16%	14%
Friday 15.5% (*N* = 265)	16%	11%	12%
Saturday 12.7% (*N* = 216)	13%	11%	15%

insurance information is difficult to obtain. The psychotic adolescent requires a thorough laboratory evaluation, medical assessment, and detailed physical and psychiatric history before a disposition is made and implemented. By contrast, an anxious elderly patient is usually referred to the psychiatric crisis team by the emergency department physicians, who have assessed the patient and initiated laboratory studies. The anxious elderly patient's medical history is frequently available because he or she has previously used our hospital. He is generally more able to participate in the evaluation process, and his insurance, Medicare, provides direction for disposition planning and implementation.

Second, the high number of hospitalized patients may suggest that a larger-than-expected group of acutely ill patients sought help from our suburban ED, assuming hospital criteria for admission are determined by patient need and not bed vacancy. The fact that 57% (973) of the patients were hospitalized may be a function of their ability to pay, family and community pressure, and our patient group, of whom 40% (683) were HMO members referred for psychiatric hospital screening. We recommend that further study should assess the duration of the consultation process according to time sequences: interview, laboratory analysis, corroborative discussion with referral source and family, negotiation and implementation of disposition, and use of chemical and physical restraints. This would confirm our experience and further validate Dr. Swift's [17] findings that the bulk of psychiatric emergency work occurs after the initial assessment is completed and the decision to hospitalize is made and must be arranged.

Developing cost-efficient strategies would involve the following: implementing a limited use of routine laboratory screening; defining hospital admission protocols that address exclusion criteria (catchment area, age, veteran status, medical problems, language ability, psychopathology, method of payment, court involvement and homelessness); expediting communication with insurance companies to facilitate discharge; and targeting crisis intervention to various subsets of patients. Anfinson and Kathol [18] have evaluated the routine use of laboratory studies for psychiatric patients and have recommended a limited screening for a subset of patients.

Third, this single-hospital analysis is useful in describing variations in a suburban population and may reflect differences in medical practice patterns. The picture of a patient seeking psychiatric help from our emergency room requires modification from the urban profile. The majority of our patients came for the first time and were not considered chronically ill. They were usually employed, well-groomed, sad, depressed, suicidal, and were accompanied by relatives or friends. The team's task was to work with the patient and significant others to provide relief from the emotional pain, because it is the support system that may well determine whether there will be another crisis. As Gyllenhammar et al. [19] have stated, "The real problem is then the responsibility placed on the relatives or friends. When they can no longer cope with the patient's behavior, he is brought to the hospital and often admitted." Further study is recommended in emergency departments, on the national level, to identify patient subsets relative to age, diagnosis, and recent discharge date from psychiatric hospitalization to determine service needs and implement cost-efficient protocols.

The authors gratefully acknowledge the assistance of Amanda Lee Stebbins in data analysis.

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Royal Commission into
Victoria's Mental Health System

ATTACHMENT RB-18

This is the attachment marked '**RB-18**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

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ACTA PSYCHIATRICA
SCANDINAVICA

Review

The current status of urban-rural differences in psychiatric disorders

Peen J, Schoevers RA, Beekman AT, Dekker J. The current status of urban–rural differences in psychiatric disorders.

Objective: Reviews of urban–rural differences in psychiatric disorders conclude that urban rates may be marginally higher and, specifically, somewhat higher for depression. However, pooled results are not available.
Method: A meta-analysis of urban–rural differences in prevalence was conducted on data taken from 20 population survey studies published since 1985. Pooled urban–rural odds ratios (OR) were calculated for the total prevalence of psychiatric disorders, and specifically for mood, anxiety and substance use disorders.
Results: Significant pooled urban–rural OR were found for the total prevalence of psychiatric disorders, and for mood disorders and anxiety disorders. No significant association with urbanization was found for substance use disorders. Adjustment for various confounders had a limited impact on the urban–rural OR.
Conclusion: Urbanization may be taken into account in the allocation of mental health services.

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Key words: meta-analysis; mental illness; prevalence; rural health; urban health

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Summations

- Pooled total prevalence rates for psychiatric disorders were found to be significantly higher in urban areas compared with rural areas. Specific pooled rates for mood disorders and anxiety disorders were also significantly higher in urban areas, while rates for substance use disorders did not show a difference.
- Adjustment for confounders had limited impact on urban–rural odds ratios found, which shows that urban–rural differences in prevalence rates are only partly explained by population characteristics.
- Urbanization may be taken into account in the allocation of mental health services.

Considerations

- There was heterogeneity in the dataset which might not be explained by urban–rural differences. However, possible sources of this heterogeneity that were analysed (culture, diagnostic method, diagnostic variation within diagnostic categories analysed) did not show significant differences in outcome.
- The meta-analysis was limited to developed countries.
- Schizophrenia was not included as a separate category.

Introduction

Generally, social problems and environmental stressors are more prevalent in cities than in the country. Areas with high population densities are characterized, for instance, by higher rates of criminality, mortality, social isolation, air pollution and noise (1). As the extent of various social problems is related to urbanization, it is often assumed that rates of psychiatric disorders are also correlated with urbanization. A frequently cited milestone in the study area of urban–rural differences in the prevalence of psychiatric disorders is the study by Dohrenwend and Dohrenwend (2).

This review of nine urban–rural comparisons was based on studies from 1942 to 1969 from quite diverse countries. The authors concluded that there was a tendency towards higher total rates of psychiatric disorders in urban areas. However, there was a variation in the difference depending upon the specific diagnostic category. Rates for neurosis and personality disorders were higher in urban areas, while rates for functional psychoses combined and manic-depressive psychoses separately were higher in rural areas. There was no clear trend in the rates for schizophrenia.

Since Dohrenwend and Dohrenwend (2) a number of reviews have followed (3–7), generally showing marginally higher overall rates in urban areas and, specifically, somewhat higher rates for depression. However, there is no clear trend in the outcomes, which often lack statistical significance as the studies were not pooled.

Furthermore, a number of factors may have complicated the study of a possible association between urbanization and psychopathology. First of all, definitions of 'urban' and 'rural' may vary (4). Generally, 'urban' refers to large conglomerates of people, usually in a relatively small area, resulting in relatively high population densities. The use of the term 'relatively' makes it clear that what some countries define as 'urban' using definitions from national statistical institutions or research may be defined as 'rural' in another country. The United Nations have defined an 'urban locality' as having at least 20 000 people, and a city as having at least 100 000 people (8). However, this definition was not used in any study cited here. Secondly, the concrete manifestation of urban and rural phenomena varies widely around the world. The Netherlands, for instance, does not have any metropolis such as London or New York, and the Dutch countryside is much more populated than the countryside of Arkansas.

Thirdly, there may be other cultural differences between studies and countries. The Dohrenwend & Dohrenwend review (2) covers a wide variety of cultures (7), and this may detract from the external validity of its findings.

Fourthly, there is considerable heterogeneity in the methods used in the available literature. Outcome measures vary from self-report psychological wellbeing scales to case definition by structured interviews, and prevalence rates may or may not be adjusted for different types of confounders. Since 1984, study designs have gradually improved, enhancing the validity of results. The five reviews from Dohrenwend and Dohrenwend to Marsella (2–7) were based partially on older designs, and partially on more recent, and more sophisticated designs. In line with this heterogeneity, none of the previous reviews was able to pool the data and perform meta-analyses.

Aims of the study

This study sought to investigate the links between urbanization and psychopathology in a meta-analysis using only studies of higher methodological quality with adjustment for important confounders. Bias through cultural and environmental variation was limited by including only studies from developed countries. This allowed us to establish more accurately the existence and magnitude of potential urban–rural differences in levels of psychopathology. Establishing urban–rural differences for psychiatric disorders not only has scientific value – by extending our models with factors that affect the onset of mental disorders – but may also have consequences for the allocation of mental health resources to areas with higher levels of urbanization.

Material and methods

Selection criteria

We included population surveys presenting urban–rural differences in psychiatric disorders since 1985. We restricted our study to developed countries. The studies included were all based on reliable diagnostic processes using standardized structured interviews.

We present studies dealing with total rates of psychiatric morbidity, mood disorders, anxiety disorders and substance use disorders. For 'mood disorders', rates for major depressive episodes were used when available. In the absence of rates for major depressive episodes, rates for combinations of mood disorder were used. In the area of 'substance use disorders', rates for alcohol abuse or alcohol dependence (combined in some cases) were used when there were no total rates for substance use disorders. As stated above, there was variation in the diagnostic content within the diagnostic groups of which prevalence rates were pooled in this study. The rationale for this was that we wanted to include a reasonable number of studies in each diagnostic group. Furthermore, we have performed additional analyses if possible, to check for within-group variation in urban–rural associations due to differences in diagnostic content.

As reliable rates are generally difficult to establish for schizophrenia in standard population surveys due to the low prevalence of schizophrenia in the non-institutionalized community, we did not include results for schizophrenia. Finally, we included only studies of adults or of all age groups.

Search strategy

Our database search comprised all publications from 1985 onwards containing the subject headings 'mental health' or 'mental disorders' and i) 'urban' and 'rural' or with ii) 'city residence', 'city born', 'city living'. The databases used were: all EBM reviews, Embase psychiatry, Medline and Psycinfo. A selection based on the abstracts was made from the initial search results ($n = 620$). Studies concerning less developed countries were also left out. We were left with 110 studies relating to the subject. Figure 1 shows the subsequent stepwise exclusion process.

Data extraction and statistical analysis

All the selected studies provided basic urban and rural prevalence rates or urban–rural odds ratios (OR) which had been at least controlled for age and gender. However, most studies also presented rates or OR adjusted for a wider range of variables (these are summed up for each study in Table 1). In this study, we refer to the first group of rates as 'unadjusted OR' (controlled for age and gender at best) and to the second group as 'adjusted OR' (adjusted for more than age and gender). If available, a 12-month rate was chosen as the outcome measure. Another available rate was used in other cases.

Unadjusted and adjusted OR with 95% confidence intervals were collected for all included studies. Some OR and confidence intervals could be calculated from the available numbers, even though they were not stated in the studies. Some stated only that there was no significant difference for urbanization or that urbanization was not a significant predictor in a logistic model. An OR of 1 is used for these cases in the figures.

Selected from database/literature search: 110

1) No urban–rural comparison related to the subject: 58

2) No population survey (utilization data): 11

3) Restricted to a diagnostic group outside our focus: 10

4) Restricted to a demographic subgroup: 1

5) No clear urban–rural distinction: 1

6) No dichotomous outcome measure: 1

7) Duplicate use of same data in different publications: 8

Remaining urban–rural comparisons for meta-analysis: 20

Fig. 1. The selection process within the initial search result.

When studies provided more than two categories of urbanization, the most extreme dichotomy – metropolis vs. rural, for instance – was chosen for the analysis. In all selected studies, the level of urbanization concerns the level or urbanization at the time of measurement.

The Review Manager (RevMan 4.2, Cochrane IMS, Oxford, UK) was used to perform meta-analyses. Log OR and their standard errors were entered in the program. The generic inverse variance option was used. Pooled ORs were estimated using random effect modelling as there was a high level of heterogeneity between included studies.

Two authors (JP and JD) acting independently were responsible for the reading and the extraction of data (including cross-checking) from the studies selected for the meta-analysis. Any differences in outcome were resolved by discussion.

Findings

Table 1 lists the 20 studies that were included. Looking at the number of studies per country, Great Britain, the Netherlands, Canada and the USA appear to be well represented. As far as the year of publication is concerned, 12 of the 20 studies were published after 2000, six in the 1990s and two in the period 1985–1989. Two European multi-country studies are presented in the table. The first is the ODIN study of depression covering Norway, Finland, Great Britain and Ireland (13). The second is the Esemed study covering France, Italy, Spain, Belgium, Germany and the Netherlands (15). Most studies presented 12-month prevalence rates (13/20). The age ranges ≥18 and 18–64 years were most common. Ten studies used the composite international diagnostic interview as the diagnostic instrument, three studies used the general health questionnaire screening instrument (other $n = 7$). The distinction between urban and rural areas was made in different ways. Straightforward approaches are 'interviewer judgement' (separately for each respondent), 'population size' and 'population density'. 'Concentration of addresses' is a measure of human activity, including industrial activity. 'Demographic characteristics' was also used for area classification.

Most studies used two categories to differentiate between urban and rural (the maximum number of

Table 1. Population-based prevalence studies included in meta-analysis of urban–rural differences in psychiatric disorders

Studies	Year of publication	Country	Disorder(s) (unadjusted rate)*	Disorder(s) (adjusted rate)*	Outcome measure	Age range (years)	Screening / diagnostic instrument	Classification system	Sample size	Urban / rural categorization based on	No. categories	Adjusted for†
Europe												
Madianos & Stefanis (9)	1992	Greece	2	–	Point prev	18–64	CES-D	DSM-III-R	3706	Demogr. charact.	4	–
Hodiamont et al. (10)	1992	Netherlands	1	–	Point prev	18–65	GHQ / PSE	–	3232	Demogr. charact.	2	–
Lewis & Booth (11)	1994	Great Britain	1	1	Point prev	> 18	GHQ	–	6572	Interviewer judgement	3	1,2,4,8,chronic illness
Paykell et al. (12)	2000	Great Britain	1,4	1,4	1 wk prev	16–64	CIS-R / US-NAS	–	9777	Interviewer judgement	3	1,2,3,4,5,6,8,life events,prim. supp. group, perceived soc. support,tenure,accomm. type
Ayuso-Mateos et al. (13)	2001	Finland, Great Britain, Ireland, Norway	2	–	12 m prev	18–64	BDI / SCAN	DSM-IV	7622	Demogr. charact.	2	–
Kovess-Masfety et al. (14)	2005	France	2	2	12 m prev	≥18	CIDI-S	DSM-IV	2628	Demogr. charact.	2	1,2,3,life events
Kovess-Masfety et al. (15)	2005	Belgium, France, Germany, Italy, The Netherlands, Spain	1,2,3,4	1,2,3,4	12 m prev	≥18	CIDI	DSM-IV	21425	Pop. size	2	1,3,8
Weich et al. (16)	2006	Great Britain	1	1	12 m inc	16–74	GHQ	–	7659	Pop. density / demogr. charact.	2	1,2,3,4,6,8,9,curr. health probl.,housing tenure, overcrowding,housing probl., househ. type
Kringlen et al. (17)	2006	Norway	1,2,3,4	–	12 m prev	18–65	CIDI	DSM-III-R	3146	Demogr. charact.	2	–
Peen et al. (18)	2007	The Netherlands	1,2,3,4	1,2,3,4	12 m prev	18–64	CIDI	DSM-III-R	7076	Concentration of addresses	5	1,2,5,9,occup. status,househ. comp.
Dekker et al. (19)	2008	Germany	1,2,3,4	1,2,3,4	12 m prev	18–64	CIDI	DSM-IV	4181	Pop. size / demogr. charact.	2	1,2,3,4, and interactions with urb.
North America												
Blazer et al. (20)	1985	United States	2,3,4	2,3,4	12 m prev	≥18	DIS	DSM-III	3798	Demogr. charact.	2	1,2,3,5,7,residential mob.
Kovess et al. (21)	1987	Canada	2	2	12 m prev	≥18	SCL29 / Wellb	DSM-III	3080	Demogr. charact.	3	1,2,3,5,life events
Kessler et al. (22)	1994	United States	–	1,2,3,4	12 m prev	15–54	CIDI	DSM-III-R	8098	Demogr. charact.	3	1,2,3,5,7,living arrangem.,region
Parikh et al. (23)	1996	Canada	2	–	12 m prev	≥15	UM-CIDI	DSM-III-R	9953	Demogr. charact.	2	–
Wang (24)	2004	Canada	2	2	12 m prev	≥12	CIDI	DSM-III-R	17244	Demogr. charact. / pop. density	2	3,7,8,immigr. st.
Kessler et al. (25)	2005	United States	–	2,4	12 m prev	≥18	CIDI	DSM-IV	3199	Demogr. charact.	6	1,2,3,5,6,7,9
Rohrer et al. (26)	2005	United States	1	1	1 m prev	≥18	BRFSS	FMD	5757	Demogr. charact.	3	1,2,3,5,7,9,BMI
Other												
Lee et al. (27)	1990	South Korea	1,2,3,4	–	Lifet. prev	18–65	DIS-III	DSM-III	5100	Demogr. charact.	2	–
Andrews et al. (28)	2001	Australia	1,2,3,4	1,2,3,4	12 m prev	≥18	CIDI	ICD-10	10641	Pop. size	3	1,2,3,5,8,country of birth

*1 = total rate of psychiatric disorders; 2 = mood disorders; 3 = anxiety disorders; 4 = substance use disorders.

†1 = age; 2 = gender; 3 = marital status; 4 = social class; 5 = educational level; 6 = ethnicity; 7 = race; 8 = unemployment; 9 = income.

CIBI, composite international diagnostic interview; GHQ, general health questionnaire.

categories used was six). Eighteen of the 20 studies presented unadjusted OR, while 14 out of 20 presented adjusted ratios (12 presented both). Of the six studies without adjusted ratios, four dated from before 2000. Adjusted odds were generally adjusted for a large number of confounders (up to a maximum of 14). In Wang (24), the adjusted odds were not adjusted for age and sex in a logistic regression model, because these factors were not found to be a potential confounder in a preceding bivariate analysis.

In Table 2 the contents of the prevalence rates used in the pooled analyses are specified. Concerning prevalence rates for 'any disorder' some rates were based on diagnoses while other rates were based on cut-off scores. Concerning mood disorders some studies report total prevalence rates for mood disorders, while other studies report figures of major depression plus dysthymia or only major depression. Two of the studies reporting anxiety disorders only reported prevalence rates of distinct anxiety categories, as a total of anxiety disorders was not available. The studies reporting on substance use disorders can be divided in a group reporting on both alcohol and drug abuse and dependence, and in a second group only reporting on alcohol abuse and dependence.

Figure 2 presents a forest plot of unadjusted OR for 'any disorder' (16 comparisons), ordered by year of publication. The number of comparisons from European countries was much higher ($n = 13$) than from outside Europe ($n = 3$). Of the unadjusted OR, 56% indicated an urban–rural OR significantly higher than 1. Thirty-eight per cent of the studies presented no significant OR and one Belgian study (6%) found an urban–rural OR significantly less than 1 (15). Given the heterogeneity of the 14 studies, we used random effect modelling for the pooled result. The pooled unadjusted OR was 1.38 (1.17–1.64), $P < 0.001$. The pooled adjusted OR was slightly lower: 1.21 (1.09–1.34), $P < 0.001$ (14 comparisons; data not shown).

Figure 3 shows the unadjusted OR for mood disorders (21 comparisons). By contrast to the unadjusted odds for 'any disorder', the proportion of non-European comparisons was higher (29%; $n = 6$ non-European and $n = 15$ European). Thirty-three per cent of the studies found a significant urban–rural unadjusted OR higher than 1 for urban areas compared to rural areas,

Table 2. Specific contents of prevalence rates used in the meta-analysis of urban–rural differences in psychiatric disorders

	Unadjusted rates				Adjusted rates			
Studies	Total	Mood disorders	Anxiety disorders	Substance use disorders	Total	Mood disorders	Anxiety disorders	Substance use disorders
Europe								
Madianos & Stefanis (9)		1a						
Hodiamont et al. (10)	GHQ-30 ≥ 10/PSE > 4							
Lewis & Booth (11)	GHQ-30 ≥ 5				GHQ-30 ≥ 5			
Paykell et al. (12)	CIS-R ≥ 12			US-NAS-12 ≥ 3	CIS-R ≥ 12			US-NAS-12 ≥ 3
Ayuso-Mateos et al. (13)		1a						
Kovess-Masfety et al. (14)		1a			1a			
Kovess-Masfety et al. (15)	1a,b,2a,b,c,d,e,g,3a,b	1a,b	2a,b,c,d,e,g	3a,b	1a,b,2a,b,c,d,e,g,3a,b	1a,b	2a,b,c,d,e,g	3a,b
Weich et al. (16)	GHQ-12 ≥ 3				GHQ-12 ≥ 3			
Kringlen et al. (17)	1,2a,b,c,d,e,f,3a,b,c,d,4,5a,6	1a	2c	3a,b				
Peen et al. (18)	1,2a,b,c,d,e,f,3a,b,c,d,4,6	1	2a,b,c,d,e,f	3a,b,c,d	1,2a,b,c,d,e,f,3a,b,c,d,4,6	1	2a,b,c,d,e,f	3a,b,c,d
Dekker et al. (19)	1,2a,b,c,d,e,f,3a,b,e,4c,5	1	2a,b,c,d,e,f	3a,b,e	1,2a,b,c,d,e,f,3a,b,e,4c,5	1	2a,b,c,d,e,f	3a,b,e
North America								
Blazer et al. (20)		1a	2a	3a,b		1a	2a	3a,b
Kovess et al. (21)		1a,b				1a,b		
Kessler et al. (22)					1,2a,b,c,d,e,3a,b,c,d,4,8	1	2a,b,c,d,e	3a,b,c,d
Parikh et al. (23)		1						
Wang (24)		1a				1a		
Kessler et al. (25)						1a		3a,b,c,d
Rohrer et al. (26)	FMD ≥ 14 van 30				FMD ≥ 14 van 30			
Other								
Lee et al. (27)	1,2a,b,c,d,e,f,3a,b,c,d,4a,b, 5a,6a,7,8,9a,b	1	2a,b,c,d,e,f	3a,b,c,d				
Andrews et al. (28)	1a,b,2a,b,d,e,f,g,3a,b,c,d	1a,b	2a,b,d,e,f,g	3a,b,c,d	1a,b,2a,b,d,e,f,g,3a,b,c,d	1a,b	2a,b,d,e,f,g	3a,b,c,d

1 = mood disorders; 1a = major depression; 1b = dysthymia; 1c = bipolar disorder; 2 = anxiety disorder; 2a = agoraphobia; 2b = social phobia; 2c = simple phobia; 2d = panic disorder; 2e = GAD; 2f = OCD; 2g = PTSD; 3 = substance use; 3a = alcohol dependence; 3b = alcohol abuse; 3c = drug dependence; 3d = drug abuse; 3e = illicit drug use; 4 = non-affective psychosis; 4a = schizophrenia; 4b = schizophreniform disorder; 4c = possible psychotic disorder; 5 = somatoform disorder; 5a = somatization disorder; 6 = eating disorder; 6a = anorexia; 7 = gambling; 8 = antisocial personality disorder; 9a = mild cognitive impairment; 9b = severe cognitive impairment.
GHQ, general health questionnaire.

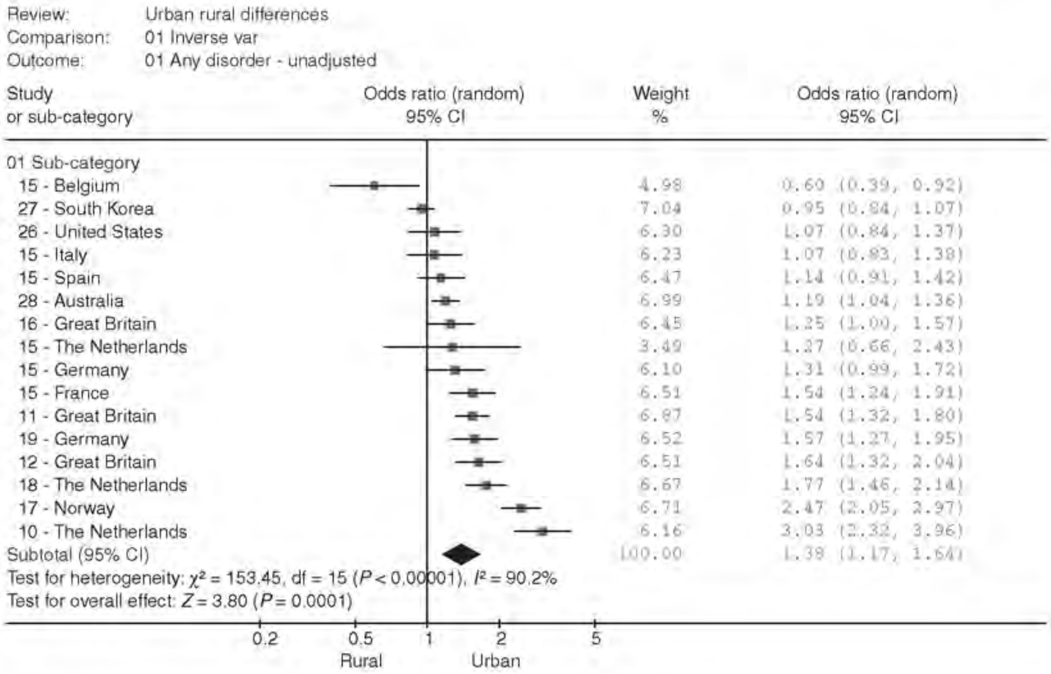

Fig. 2. Urban–rural comparisons of any disorder, unadjusted OR with 95% CI.

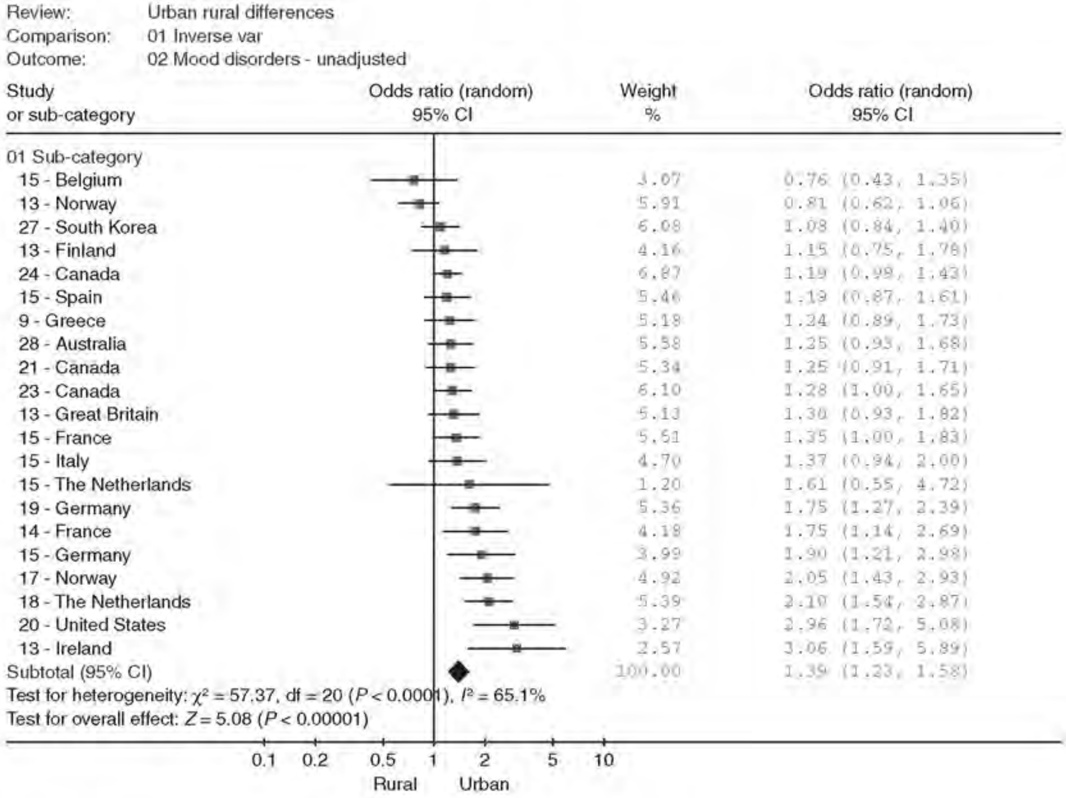

Fig. 3. Urban–rural comparisons of mood disorders, unadjusted OR with 95% CI.

while 67% of the studies presented no significant unadjusted OR. None of the studies found a significant urban–rural OR less than 1. The pooled unadjusted OR for mood disorders was 1.39 (1.23–1.58), $P < 0.0001$. The pooled adjusted OR was somewhat lower: 1.28 (1.13–

1.44), $P < 0.001$ (15 comparisons; data not shown).

Figure 4 shows the unadjusted OR for anxiety disorders (12 comparisons). The number of comparisons in this figure is lower ($n = 12$) than those for 'any disorder' ($n = 16$) or 'mood disorder' ($n = 21$). Of these 12, nine were from Europe and three from outside Europe. The majority of unadjusted OR indicated no difference (67%). Thirty-three per cent indicated an urban–rural OR significantly higher than 1. The pooled unadjusted OR for anxiety disorders was 1.21 (1.02–1.42), $P = 0.03$. The pooled adjusted OR was 1.13 (1.00–1.28), $P = 0.06$ (11 comparisons; data not shown).

Figure 5 shows the unadjusted OR for substance use disorders (13 comparisons). Of the 13 available comparisons, 10 were from Europe and three from outside Europe. As was the case with anxiety disorders, the majority of unadjusted OR indicated no difference (69%). Three studies found a significant urban–rural OR higher than 1 (23%) and

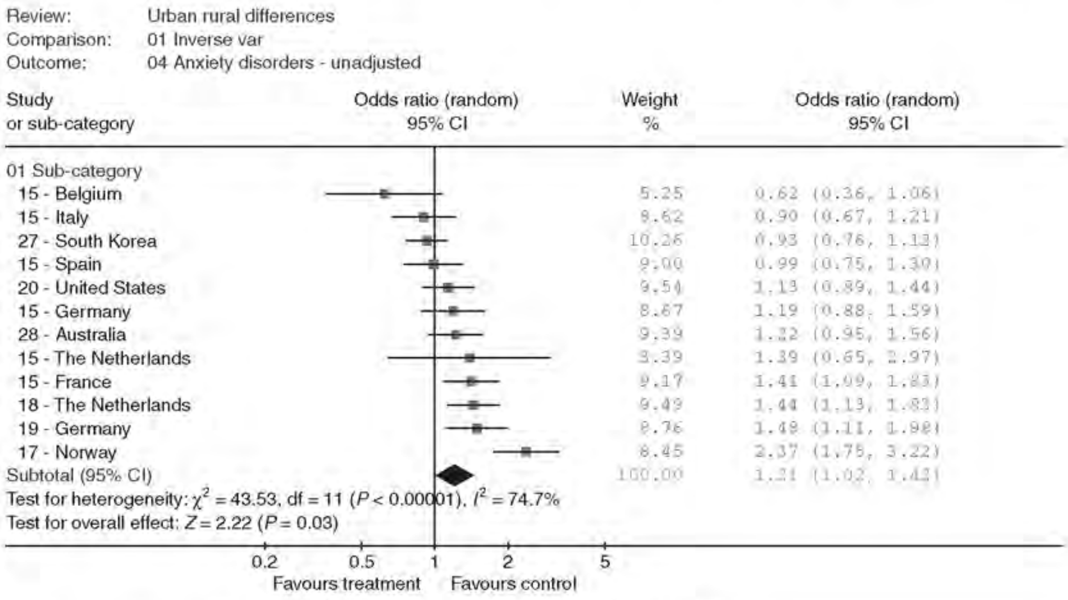

Fig. 4. Urban–rural comparisons of anxiety disorders, unadjusted OR with 95% CI.

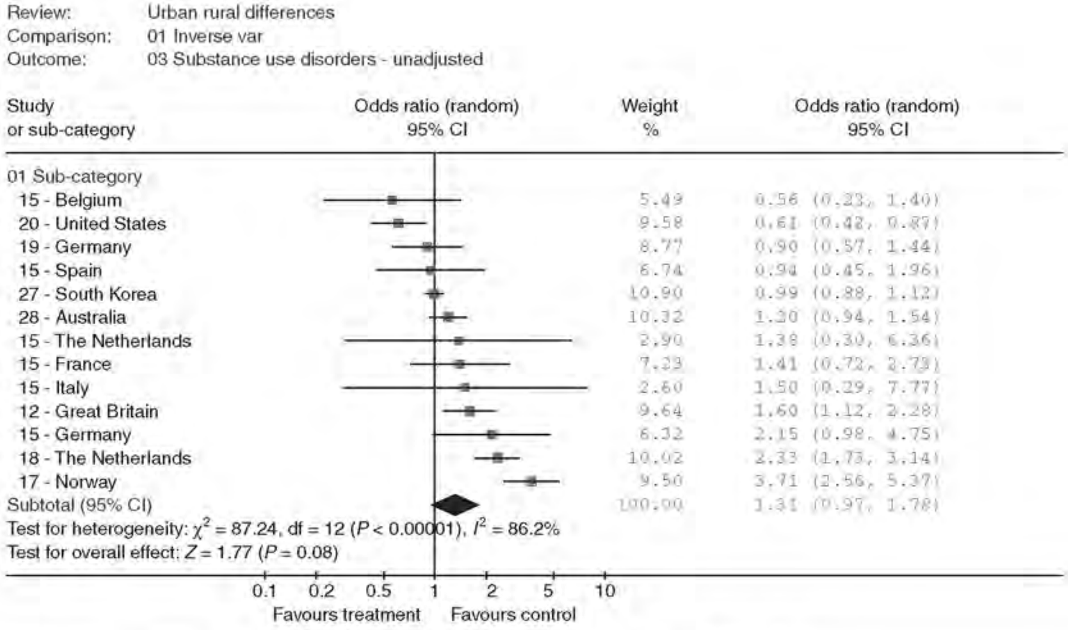

Fig. 5. Urban–rural comparisons of substance use disorders, unadjusted OR with 95% CI.

one study (8%) found a significant urban–rural OR less than 1. The pooled unadjusted OR was 1.31 (0.97–1.78), $P = 0.08$. The adjusted OR was 1.03 (0.85–1.26), $P = 0.74$ (13 comparisons; data not shown).

Heterogeneity

Several possible sources of heterogeneity, apart from urban–rural variations, can be put forward. These sources can be differences in culture or socioeconomic status of the countries involved, but also differences in the contents of the prevalence rates used and the way in which they were established (see Table 2). Therefore, we made some additional comparisons within the diagnostic categories reported in this study (if the available number of studies was sufficient to do so). To analyse possible heterogeneity due to culture, we compared the pooled (unadjusted) prevalence rate for mood disorders for European studies to the pooled rate for the North American studies (see Tables 1 and 2). No difference was found [1.44 (CI: 1.20–1.71) and 1.40 (CI: 1.08–1.82) respectively]. Furthermore, we analysed possible heterogeneity due to method in which prevalence rates were established in each study. Therefore, we compared prevalence rates for 'any disorder' based on diagnostic instruments to rates based on cut-off scores (see Tables 1 and 2). No differences were found in both unadjusted [1.30 (CI: 1.05–1.60) and 1.59 (CI: 1.18–2.13)] and adjusted rates [1.17 (CI: 1.01–1.35) and 1.29 (CI: 1.16–1.44)]. Subsequently, possible heterogeneity within diagnostic groups was analysed. First, within (unadjusted) rates for mood disorders, studies from which rates of major depression were used compared with other studies (mainly containing mood disorders in general; see Table 2). No difference was found [1.48 (CI: 1.15–1.90) and 1.36 (CI: 1.19–1.56)]. Likewise, within (unadjusted) rates for substance use disorders, we compared studies presenting rates for alcohol dependence and abuse to studies also including drug dependence and abuse. No difference was found [1.33 (CI: 0.79–2.25) and 1.26 (CI: 0.86–1.86)].

Discussion

This is the first meta-analysis investigating urban–rural differences in prevalence rates for common mental disorders. Using only higher quality studies performed since 1985 in high income countries, it was shown for both 'any disorder' (38% higher), mood disorders (39%) and anxiety disorders (21%) that the pooled urban prevalence rate was higher in urban areas compared with rural areas. No difference was found for substance use disorders. In addition, when controlling for important confounders, we found slightly lower, but statistically significant, pooled OR. While the number of confounders was generally considerable, this difference between adjusted and unadjusted ratios was limited, showing that urban–rural differences are only partly explained by population characteristics.

Although both the use of standardized diagnostic instruments and the extent to which findings are adjusted for potential confounders has significantly increased since the period before 1985, the current study thus confirms less systematically evaluated findings from earlier reviews (2–7).

One could argue that the association with urbanization presented here is low at 1.21 (1.09–1.34) for 'any disorder'. Compared to other factors associated with the prevalence of psychiatric disorders – such as being unmarried or childhood abuse – the strength of the association with urbanization is limited. Nevertheless, it remains intriguing that, even when controlling for a relatively large number of confounders, the urban environment seems to be associated with the prevalence of psychopathology. This association does not appear to be explained solely by population characteristics such as age, gender, marital status, social class or ethnicity. In line with studies examining the association between the urban environment and schizophrenia (29), we found that the urban environment appears to be associated with mental health. Further study is needed to establish whether this association can partly be explained by gene–environment interactions (30).

Furthermore, the practical implications of 34% more cases in urbanized areas are significant in terms of service allocation and healthcare budget. The allocation of more services to urban areas is not only desirable because of the prevalence rates, but also because comorbidity rates tend to be higher in urban areas (18, 22). Generally, the distribution of funds does not keep up with the extra need for services in urban areas. The consequences are, for instance, relatively long waiting lists and pressure to keep treatments and admissions short, putting the quality of care at risk. Ideally, a match between the provision of services and demand for mental health care is the best option. Based on our findings, urbanization may be a useful indicator for allocating mental health funds and services.

When interpreting these findings, a number of potential limitations should be addressed. Several possible sources of heterogeneity apart from urban–rural variation can be mentioned concerning this study. As the analysis contains studies in a period of 20 years from all over the world there is possible heterogeneity due to diagnostic methods, culture and socioeconomic status for instance. Apart from this, also differences in the diagnostic contents of the prevalence rates used may be a source of heterogeneity. For instance, rates used for the analysis of mood disorders containing 'only' major depression may have a different relation to urbanization compared to rates containing all mood disorders. In addition, the latter contrast may also represent a difference in severity. In a secondary analysis we made some comparisons concerning possible heterogeneity due to culture (Europe vs. North America), diagnostic method (diagnostic instruments vs. cut-off scores) and diagnostic content (major depression vs. mood disorders as a whole and alcohol abuse/dependence vs. substance use disorders as a whole). These comparisons did not show any significant differences, which may lower concerns about systematic heterogeneity in this study.

It has to be taken into account that there is comorbidity between diagnostic groups reported in this study, for instance between anxiety and mood disorders. This means that some research subjects will be present in more than one comparison. A more or less similar point is that studies which are included in two or more diagnostic groups analysed here, have a relatively larger weight compared to studies which are only included in one diagnostic group.

A limitation of the study is that schizophrenia was not included as a separate diagnostic category. It is difficult to generate reliable prevalence rates for schizophrenia from general population studies due to both the low prevalence of schizophrenia in the non-institutionalized community, and to selective exclusion of these patients from population surveys (31). Accordingly, most of the studies in our analysis did not present rates for schizophrenia.

Our review included two multi-country studies (13, 15) (one deals with mood disorders only), and we presented the results for each of the individual countries. As there is a wide variation of outcomes between countries within these studies, and as the findings do not systematically differ from other studies, we believe this is the preferred strategy. Presenting ratios for the total study area only would have resulted in the loss of information about variation between countries within the areas. The Esemed study, for example, found that Belgium, which has higher total rural rates compared to urban rates, differs substantially from its neighbouring countries (15).

One could argue that using dichotomized measures for urbanization would underestimate the influence of this factor on levels of psychopathology. Using continuous measures or comparing the extremes of more than two categories of urbanization, would probably yield a significant difference more easily. However, most studies did not provide such data. Furthermore, this rule applies only to studies of large connected areas (countries, for example). However, the choice of either one or the other separate area in a 'twin study' has implications for the possibility of finding differences (7). When one chooses to compare one typically rural area with a metropolitan area, the initial differences in urbanization are probably greater than between the extremes of a division into five categories of a whole country. After all, 'urban' and 'rural' are relative concepts, and their operationalization will probably always differ between studies.

To explain inner-city and urban–rural variations in psychiatric morbidity, there are two main theoretical concepts, which originated from the early ecological research of schizophrenia (32) and from the Chicago School of Sociology (33): the drift hypothesis and the breeder hypothesis. The drift hypothesis assumes on the one hand that sick and vulnerable people are more or less doomed to remain in socially unstable, deprived neighbourhoods, while better off people move away (social residue theory; 34). On the other hand, socially deprived neighbourhoods can also have a 'pull-function' on sick and vulnerable people, as they move to these areas with low social control and greater tolerance towards deviant behaviour (social drift hypothesis). Evidence concerning drift processes is still sparse (6, 35). However, concentration of schizophrenic patients in deprived inner-city areas has been described in numerous ecological studies (32, 36). It remains to be seen however, if these supposed drift processes apply to all psychiatric illnesses. The second theory, the breeder hypothesis, assumes that various environmental factors cause illness. These can be physical factors (air pollution, small housing, population density) and also social factors (stress, life events, perinatal aspects, social isolation). A lot of the stress factors mentioned above are more common in urbanized areas (1, 37).Urbanization is modestly but consistently associated with the prevalence of psychopathology. This should be further examined in studies of the aetiology of mood and anxiety disorders in particular. Levels of urbanization should also be taken into account when planning the allocation of mental health services.

Declaration of interest

None.

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Royal Commission into
Victoria's Mental Health System

ATTACHMENT RB-19

This is the attachment marked '**RB-19**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

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Are mental disorders more common in urban than rural areas of the United States?

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ABSTRACT

Urban vs. rural residence is commonly cited as a risk factor for depression and other mental disorders, but epidemiological evidence for this relationship in the US is inconclusive. We examined three consecutive annual samples (2009–2011) of adolescents (age 12–17, $N = 55{,}583$) and adults (age 18 and over, $N = 116{,}459$) from the National Survey of Drug Use and Health (NSDUH) to compare the prevalence of major depression and other serious mental illness across four categories of urbanicity: 1) large metropolitan areas, 2) small metropolitan areas, 3) semi-rural areas, and 4) rural areas, with and without adjustment for other demographic risk factors. For adolescents, no association was observed between urbanicity and the prevalence of major depression, with or without statistical adjustments. For adults, no differences were found in the prevalence of major depression or serious mental illness between large metropolitan areas and rural areas, but the prevalence of both was slightly higher in the two intermediate urbanicity categories than in large metropolitan areas, with statistically significant odds ratios after adjustment ranging from 1.12 to 1.19. Contrary to expectations, the prevalence of mental disorders was not higher in the most urban compared with the most rural areas, suggesting that the move to identify mechanistic explanations for risk associated with the urban environment is premature. Evidence of slightly higher prevalence in small urban and semi-rural areas relative to large urban areas, reported for the first time, requires additional investigation.

1. Introduction

Reports of high risk for depression and other common psychiatric disorders in urban relative to rural areas have motivated research designed to identify distinctive characteristics shared by urban areas that might play an etiological role in these disorders. Social factors, including lack of network ties and concentration of poverty (Marsella, 1998; Galea et al., 2007) have been suspected. Further, based on the assumption that urban areas are deleterious for mental health, studies have examined biological mechanisms through which postulated features of urban environments are hypothesized to cause disorder, including neurodevelopmental (Lederbogen et al., 2011) and epigenetic mechanisms (Galea, 2011; Galea et al., 2011). However, close examination of the literature regarding urban/rural differences in risk for psychiatric disorders suggests that the evidence for a deleterious effect of the urban environment on mental health is inconclusive, particularly for the United States.

The strongest evidence for a preponderance of psychiatric disorders in urban relative to rural areas comes from a widely cited meta-analysis published in 2010 that combined published data from 16 countries and reported pooled, unadjusted relative odds of depressive disorder of 1.39 (95% CI: 1.23–1.58) in urban compared with rural areas (Peen et al., 2010). It is important to note, however, that the meta-analysis results reflect the location, size and selection of the included studies and that extrapolation requires a strong assumption about the homogeneity of the underlying relationship. Moreover, the generalizability of the meta-analytic results to the US is also limited because the single US study in the meta-analysis did not include subjects drawn from a large metropolitan area. That study, conducted in the early 1980s, compared the prevalence of depression in a Southern college town with a population of 150,000 with the prevalence of depression in nearby rural counties (Blazer et al., 1985). The only US national study which has reported urban-rural comparisons in DSM disorders reported no significant differences (Kessler et al., 1994), while a national study based on a screening test for depression found evidence of higher risk in rural relative to urban areas (Probst et al., 2006).

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The paucity of evidence from the US for this widely referenced epidemiological phenomenon and the importance of this evidence for understanding cross-national heterogeneity motivated the current study. Three consecutive years of data were pooled from a large annual population survey, the National Survey of Drug Use and Health (NSDUH), which includes structured assessments of major depression in adolescents (age 12–17) and adults (age 18 and older). In addition, the adult sample was also assessed for serious mental illness (SMI), defined by a validated composite measure of psychological distress and functional impairment (Novak et al., 2010). Comparisons are made across four levels of urbanicity: large and small metropolitan areas, semi-rural areas (based around small urbanized zones with between 10,000 and 50,000 inhabitants that are commonly grouped with rural areas), and truly rural areas (i.e. those not integrated economically with an urbanized area). These data afford the opportunity for a direct and up-to-date empirical test of the common wisdom regarding urban-rural differences in the prevalence of depression and other serious mental illness in the US. In addition, this is the first study of urban-rural differences to include a representative sample of adolescents among whom selective migration is less likely to affect the association between urbanicity and the prevalence of psychiatric disorder.

2. Methods

National samples of youth (age 12–17) and adults (age 18 and over) were formed by combining three consecutive annual samples (2009–2011) from the National Survey of Drug Use and Health (NSDUH). (Substance Abuse and Mental Health Services Administration, 2013) The NSDUH is the nation's primary substance use and mental health surveillance survey. Conducted annually by the Substance Abuse and Mental Health Services Administration (SAMHSA), the survey conducts face-to-face computer assisted in-home interviews with a nationally representative sample of the civilian population living in households and non-institutional group living quarters (e.g. homeless shelters, dormitories, and rooming houses). Sensitive items are assessed using Audio Computer Assisted Self-Interviewing (ACASI) methods, where respondents use a laptop computer to confidentially answer questions that are read to them through headphones. The sample design is state-based, comprised of independent multi-stage area probability samples within each of the 50 states and the District of Columbia.

2.1. Mental health assessment

DSM-IV criteria for major depression are measured for youth and adults in the NSDUH using a fully structured diagnostic instrument based on depression module of the World Mental Health Version of the Composite International Diagnostic Instrument (WMH-CIDI) (Kessler and Ustun, 2004; Hedden et al., 2012). The impairment criteria are assessed with the Sheehan Disability Scale, a visual analog scale which asks respondents to rate their impairment during their worst episode in the past year in four role domains: household responsibilities, work, close relationships, and social life (Leon et al., 1992; Leon et al., 1997). Respondents who met symptom criteria *and* reported severe impairment in at least one domain during the past year were considered to have past-year major depression (Gfroerer et al., 2012; RTI International, 2012).

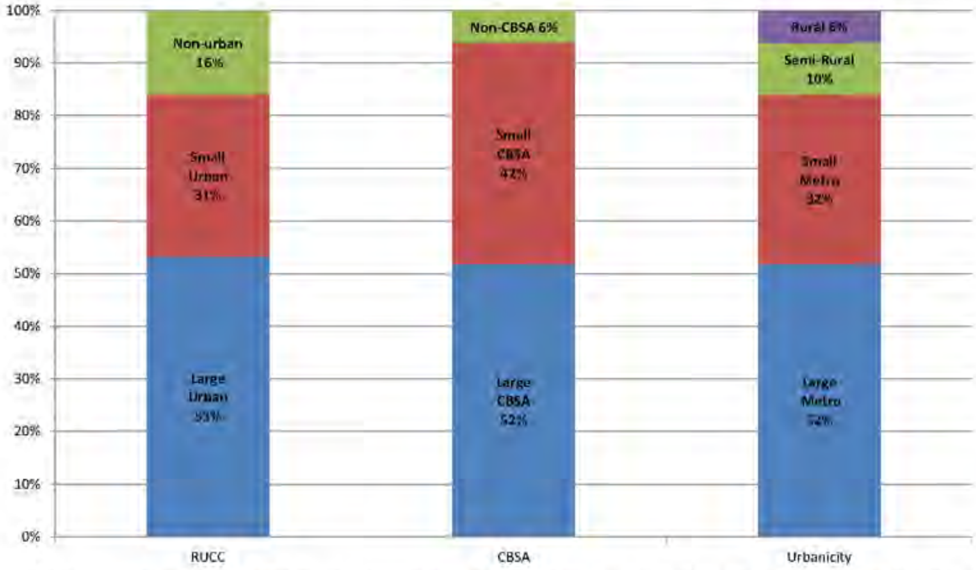
Serious mental illness (SMI) was defined using an algorithm which combines information on psychological distress, assessed with the K6, and functional impairment due, assessed with a shortened version of the World Health Organization Disability Assessment Scale (WHODAS) (Rehm et al., 1999). The K6 is a six item psychological distress scale that maintains good precision in the top decile of the score distribution, i.e. the range in which clinical intervention is likely to be indicated (Kessler et al., 2002; Kessler et al., 2003). The 8-item version of the WHODAS, focusing on impairment due to "emotions, nerves or mental health" was developed from item response theory analyses of the full 16-item version employed in the 2002 NSDUH survey (Novak et al., 2010). The algorithm for combining scores was calibrated in the Mental Health Surveillance Study, a methodological study embedded within the 2008 fielding of the NSDUH in which 1500 respondents were re-interviewed with a structured clinical instrument for DSM Axis 1 disorders (Aldworth et al., 2010; Colpe et al., 2010). Models combining scores from the K6 and WHODAS in the NSDUH were compared with respect to their prediction of independent assessments of SMI from the clinical re-interviews (Liao et al., 2012).

2.2. Urban-rural definition

The public access NSDUH dataset includes two three-level geographic variables, one based on the US Department of Agriculture's Rural Urban Continuum Codes (RUCC) (USDA Economic Research Service, 2013), and the other based on the US Bureau of the Census's Core-Based Statistical Areas (CBSA) (United States Census Bureau, 2013). The RUCC-based variable distinguishes between large and small metropolitan areas and non-metropolitan areas. Large metropolitan areas have a densely populated center with 1,000,000 or more inhabitants and they include the surrounding economically integrated areas (RUCC = 1). Small metropolitan areas are similar except that the center has between 50,000 and 1,000,000 inhabitants (RUCC = 2 or 3). All other areas are defined as non-metropolitan (RUCC = 4 through 9). According to the CBSA-based criteria, areas are categorized as 1) large CBSAs if the core area has 1,000,000 or more inhabitants, 2) small CBSAs if the core area has between 10,000 and 1,000,000 inhabitants and 3) non-CBSA otherwise (i.e. not integrated with an area of concentrated population density with 10,000 or more inhabitants). The fact that the lower bound of the small CBSA category (10,000) is lower than that of the small metropolitan area category (50,000) allows us to define a fourth category of 'semi-rural' areas. 'Semi-rural' roughly corresponds to the Office of Management and Budget's definition of micropolitan areas in that it includes areas with between 10,000 and 50,000 urban inhabitants (Office of Management and Budget, 2010).

The four-levels of urbanicity formed by combining information from the RUCC- and CBSA-based categories are shown in Fig. 1 along with their population distribution. The categories are defined as follows:

1. Large Metropolitan Area: Meets criteria for both Large Urban Area (RUCC = 1) AND Large CBSA. Due to overlap, this group is equivalent to the Large CBSA group. Examples: New York, Chicago.
2. Small Metropolitan Area: Meets criteria for a Large or Small Urban area (RUCC = 2 or 3) AND Small CBSA. This group includes residents of metropolitan areas with as few as 50,000 inhabitants. Examples: Midland, Texas; Asheville, North Carolina.
3. Semi-Rural Area: Meets criteria for Non-Urban Area (RUCCS = 4 through 9) AND Small CBSA. This group falls outside of a metropolitan area but inside of a CBSA. This definition approximates that of micropolitan areas, as defined the U.S. Office of Management and Budget (Office of Management and Budget, 2010). Examples: London, Kentucky (Laurel County); Paris, Texas (Lamar County).



RUCC=Rural Urban Continuum Codes, CBSA=Core-Based Statistical Area. Category definitions are given in the text. Percentages are weighted population proportions.

Fig. 1. Derivation of Urbanicity Categories used in this study from RUCC- and CBSA-based definitions.

4. Rural Area: Non-Urban Area (RUCCS = 4 through 9) AND Non-CBSA. Examples: Elbert County, Colorado; Vilas County, Wisconsin.

2.3. Statistical analysis

All statistical analyses were conducted using the survey sampling weights. Standard errors and statistical tests were conducted using the SUDAAN statistical software package to adjust for the complex survey design (Research Triangle Institute, 2004). Differences in population characteristics across the four urbanicity levels were tested by chi-square tests. Adjusted prevalence was calculated using the predicted marginals from logistic regression equations including survey year, age and sex as predictors. Odds ratios are reported from logistic regression equations with additional statistical adjustment for ethnicity, marital status, educational attainment for adults and ethnicity, number of residential moves in the

Table 1
Selected characteristics of the NSDUH 2009–2011 adult sample by urbanicity ($N = 116{,}459$).

Sample characteristics	N	Total		Large metro		Small metro		Semi-Rural		Rural		Chi-square DoF	Chi-square	Chi-square P-value
		%	se	%	se	%	se	%	se	%	se			
Sex														
Male	54,585	48.3	0.29	48.01	0.4	48.72	0.4	47.9	0.69	48.5	1.09	3	0.69	0.5591
Female	61,874	51.7	0.29	51.99	0.4	51.28	0.4	52.1	0.69	51.5	1.09			
Age														
Age 18–25	57,503	14.8	0.17	14.8	0.21	15.5	0.27	14.5	0.54	11.8	0.33	9	19.44	<0.0001
Age 26–34	17,160	15.8	0.16	16.8	0.29	15.5	0.26	13.7	0.57	13.4	0.53			
Age 35–49	23,858	27.3	0.26	28.2	0.43	26.9	0.36	24.9	0.45	25.4	0.77			
Age 50+	17,938	42.1	0.34	40.3	0.52	42.1	0.57	47.0	0.95	49.4	1.01			
Survey year														
2009	38,067	32.4	0.29	32.3	0.45	32.0	0.46	34.5	1.17	31.4	1.53	6	1.5	0.1948
2010	39,259	33.7	0.29	33.8	0.40	33.4	0.47	33.7	0.78	34.0	1.02			
2011	39,133	33.9	0.28	33.9	0.45	34.6	0.55	31.8	0.92	34.6	1.41			
Race/ethnicity														
NH-White	73,970	67.7	0.26	59.5	0.41	73.2	0.48	82.5	0.85	84.9	1.03	9	202.77	<0.0001
NH-Black	14,432	11.6	0.20	14.3	0.33	9.1	0.39	7.6	0.57	7.8	0.96			
Hispanic	18,063	14.1	0.20	18.0	0.31	12.2	0.45	6.4	0.46	3.6	0.35			
Other	9994	6.6	0.17	8.2	0.24	5.6	0.23	3.6	0.22	3.8	0.42			
Marital status														
Married	41,129	53.4	0.31	51.3	0.46	55.0	0.61	55.8	0.95	58.4	0.97	9	30.66	<0.0001
Widowed	2816	6.0	0.14	5.9	0.23	5.7	0.21	7.1	0.50	7.6	0.59			
Sep./Div.	10,670	13.9	0.22	13.5	0.30	13.9	0.40	15.6	0.58	15.0	0.71			
Never married	61,844	26.7	0.24	29.4	0.38	25.4	0.40	21.6	0.67	19.0	0.63			
Education														
Less than HS	18,958	14.8	0.19	13.8	0.23	14.3	0.37	17.9	0.71	20.4	0.81	9	86.75	<0.0001
HS graduate	38,079	30.5	0.26	27.1	0.37	32.0	0.49	37.1	0.75	40.5	1.06			
Some college	34,149	25.6	0.24	25.3	0.35	26.8	0.37	25.6	0.83	22.8	0.75			
College grad.	25,273	29.1	0.33	33.8	0.45	26.9	0.54	19.4	0.60	16.3	0.95			

Percentages are weighted. Standard errors and significance tests are adjusted for the complex survey design. DoF = Degrees of Freedom.

past five years, and student status (in school vs. not in school) for youth. The adult and adolescent samples are analyzed separately because of the different outcomes and control variables.

3. Results

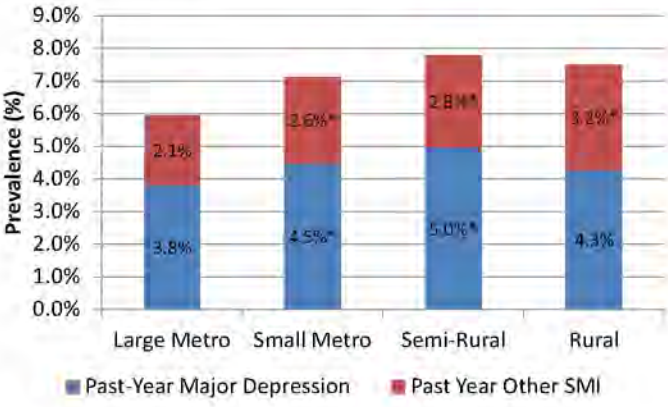
Among adults, age, ethnicity, marital status and educational attainment vary by urbanicity (Table 1). Adult respondents in less urbanized areas are older, more likely to be Non-Hispanic White and married, and less likely to have graduated from high school than residents of more urban areas. Adolescent respondents do not differ with respect to age or sex across levels of urbanicity, but are, like the adults, more likely to be non-Hispanic White if they live in rural areas (Table 2). Small, but statistically significant, urban-rural differences exist in the number of residential moves and the likelihood of being enrolled in school among the adolescent sample.

Adjusting for age, sex and survey year, the prevalence of major depression among adults does not differ between large metro and rural areas, but it is significantly higher in small metro and semi-rural areas than in large metro areas (Fig. 2). The prevalence of other SMI (i.e. SMI without major depression), is significantly lower in large metro areas than in all other areas. Among youth there are no statistically significant differences in the prevalence of major depression across urban and rural areas, adjusting for age, sex and survey year (Fig. 3).

After further statistical adjustment for ethnicity, marital status, educational attainment, risk for major depression and serious mental illness is slightly elevated in small metro and semi-rural areas relative to large metro areas (Table 3). There are no differences between large metro areas and rural areas in risk for major depression or SMI among adults or for major depression among youth.

4. Discussion

The findings from this large nationally representative sample of the US challenge the accepted wisdom that major depression and other serious mental illnesses are more common in urban than in rural areas in the US. We found no differences in risk between the most rural areas and the largest metropolitan areas for adults or youth. The findings are particularly notable because we were able to distinguish truly rural areas, i.e. those that are not socially or economically integrated with an urban center, from semi-rural areas, which include small towns and their integrated surrounding areas. Risk for major depression and other serious mental illnesses was higher in the semi-rural areas than in the large metropolitan areas. This indicates that we would not have found higher risk in urban than rural areas had we used the more common definition which combines semi-rural and rural areas into a single category. In fact, among adults, risk was slightly elevated in the two intermediate categories–small metro and semi-rural areas–relative to largest metropolitan areas, but this pattern was not observed among youth.



* Significantly different from Large Metro CBSA at p=.05 level.

Fig. 2. 12-Month prevalence of major depression and other serious mental illness in **adults** by urbanicity, adjusted for age, sex and survey year (NSDUH 2009–2011, $N = 116{,}459$).

Table 2
Selected characteristics of the NSDUH 2009–2011 youth sample by urbanicity ($N = 55{,}583$).

Sample characteristics	N	Total		Large metro		Small metro		Semi-Rural		Rural		Chi-square Dof	Chi-square	Chi-square P-value
		%	se	%	se	%	se	%	se	%	se			
Sex														
Male	28,311	51.1	0.28	51.3	0.41	50.7	0.46	51.7	0.95	51.2	1.13	3	0.43	0.7349
Female	27,272	48.9	0.28	48.7	0.41	49.3	0.46	48.3	0.95	48.8	1.13			
Age														
12 or 13	17,454	31.6	0.26	31.3	0.40	32.0	0.44	32.0	0.76	31.9	1.04	6	1.04	0.4062
14 or 15	18,631	33.8	0.25	33.9	0.42	34.1	0.46	33.4	0.80	32.3	0.94			
16 or 17	19,498	34.6	0.26	34.8	0.33	34.0	0.49	34.6	0.75	35.8	0.96			
Survey year														
2009	17,705	32.7	0.36	32.5	0.52	32.8	0.77	34.3	1.25	31.6	1.58	6	0.34	0.9136
2010	18,614	33.3	0.34	33.5	0.49	33.2	0.64	32.6	1.07	34.5	1.42			
2011	19,264	34.0	0.34	34.1	0.48	32.6	0.73	33.2	0.99	33.9	1.62			
Race/ethnicity														
NH-White	32,731	57.3	0.39	48.6	0.60	62.7	0.79	72.1	1.26	78.1	1.31	9	77.96	0.0000
NH-Black	7592	14.6	0.25	17.9	0.48	11.3	0.53	11.4	1.02	9.5	1.29			
Hispanic	9895	20.5	0.30	24.6	0.45	19.1	0.79	11.0	0.82	7.9	0.81			
Other	5365	7.6	0.19	8.9	0.27	6.9	0.36	5.5	0.37	4.6	0.42			
Past year moves														
None	43,077	77.7	0.26	78.4	0.44	76.7	0.46	77.5	0.80	77.7	0.91	6	2.26	0.0492
One	8037	14.6	0.24	14.5	0.37	14.7	0.34	14.4	0.71	14.7	0.87			
Two or more	4384	7.7	0.17	7.1	0.25	8.6	0.35	8.1	0.87	7.7	0.54			
Student status														
Enrolled	54,923	98.9	0.06	99.0	0.08	98.8	0.09	98.8	0.17	98.6	0.20	3	2.87	0.0435
Not enrolled	660	1.1	0.06	1.0	0.08	1.2	0.09	1.2	0.17	1.4	0.20			

Percentages are weighted. Standard errors and significance tests are adjusted for the complex survey design. DoF = Degrees of Freedom.

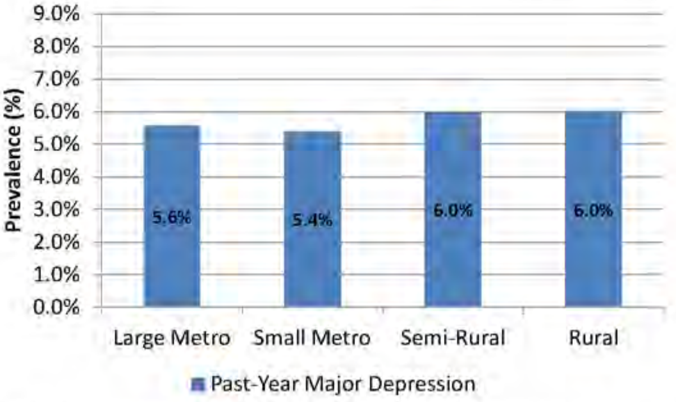


Fig. 3. 12-Month prevalence of major depression in **youth** by urbanicity, adjusted for age, sex and survey year (NSDUH 2009–2011, $N = 55{,}583$).

At first glance, these results might appear to contradict earlier studies finding that urban dwellers have higher levels of major depressive disorder relative to their rural counterparts. However, a re-examination of the research in the US indicates that this finding, while a more direct and robust test of rural-urban differences than previous epidemiological studies have provided, in fact does not contradict earlier evidence. Specifically, the study by Blazer (Blazer et al., 1985), which figured prominently as evidence of higher prevalence in urban than rural areas in the meta-analysis by Peen et al., (2010), was actually a comparison between a small metro area (the Durham, NC Metropolitan Statistical Area, which then had a population of about 150,000) and an adjacent rural area. We also found slightly higher prevalence of disorder in small metropolitan areas relative to rural areas. However, this comparison—small metro vs. rural areas–is not of primary conceptual interest with respect to urban-rural differences, which focuses on the most urban environments—large metro areas of major US cities. Previous US national surveys, which used different categorizations of urbanicity, had much smaller sample sizes and did not cover all 50 US states, suggested no differences associated with urbanicity or higher risk in rural areas (Kessler et al., 1994; Probst et al., 2006).

With respect to the international literature, the results of this study add to the observed heterogeneity of findings, ultimately undermining the conclusion that shared aspects of urban environments, independent of culture or country, have adverse effects on major depression or other SMI. The heterogeneity of findings across countries is notable. Studies in Canada find higher prevalence in urban areas (Wang, 2004; Romans et al., 2011). A recent study of 6 European countries found higher prevalence of mood disorders in urban areas in 5 countries, although only one of these findings reached statistical significance. Higher prevalence in rural areas than urban areas was found in 1 country (Kovess-Masfety et al., 2005). Heterogeneity may also be important within the U.S. Our results reflect average differences across a country with significant regional heterogeneity in local cultural, social, and economic conditions that may result in locally specific disparities. Systematic examination of regional heterogeneity within the U.S. is important and remains to be done.

Table 3
Associations of urban residence with major depression and serious mental illness among adults ($N = 116{,}459$) and major depression among youth ($N = 55{,}583$) in the NSDUH, 2009–2011.

	Large metro	Small metro		Semi-Rural		Rural	
		Or	95% CI	Or	95% CI	Or	95% CI
Adults[a]							
Major depression	1	**1.12**	**(1.01, 1.25)**	**1.19**	**(1.01, 1.40)**	1.01	(0.83, 1.23)
Serious mental illness	1	**1.13**	**(1.04, 1.23)**	**1.19**	**(1.01, 1.40)**	1.13	(0.92, 1.38)
Either MD or SMI	1	**1.14**	**(1.05, 1.22)**	**1.18**	**(1.03, 1.35)**	1.11	(0.94, 1.32)
Youth[b]							
Major depression	1	0.92	(0.81, 1.05)	1.02	(0.88, 1.18)	1.01	(0.81, 1.26)

CBSA=Core-Based Statistical Area. Figures in bold are significantly different from large metro CBSA at the $p = .05$ level.

[a] Adjusted for age, sex, ethnicity, educational attainment and marital status.

[b] Adjusted for age, sex, ethnicity, student status, and recent residential moves.

The finding of higher risk in small metropolitan and semi-rural areas relative to either large metropolitan or rural areas has not been reported in previous studies. While suggestive of environmentally- linked risk factors, this finding should be understood in light of the small effect sizes, i.e. odds ratios between 1.12 and 1.19. Studies which account for movement between levels of urbanicity relative to the timing of onset of disorders are an important next step towards identifying potential etiological pathways.

The possibility of selective migration of individuals with good mental health into more urban areas remains a methodological limitation of research on rural-urban differences. This study, as well as all those included in the meta-analysis by Peen and colleagues, are cross-sectional. Inclusion of the adolescent sample in this study reduces, but does not eliminate, the potential influence of selective migration because selective migration from rural to urban areas is most likely to occur after the age of 17, when young adults enter college or the labor force. Further sensitivity analyses conducted in this study found that the results were not substantively different when the sample was restricted to respondents who did not change residence in the past 12 months for both the adult and youth samples.

The search for etiological mechanisms for mental disorders, whether biological or social in nature, depends in part on robust large scale epidemiological investigations to describe the empirical context and suggest causal hypotheses. Despite the lack of compelling epidemiological support, there has been a general acceptance of the claim that stable features of urban environments contribute to risk for psychiatric disorders. The findings of this large scale study, combined with a closer look at the existing literature, suggest that this assumption is not empirically supported. The move towards testing mechanistic hypotheses regarding the distinctive features of urban as opposed to rural environments that exert adverse mental health effects on their residents is premature.

Conflict of interest statement

None of the authors has any conflict of interest to report.

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Author contributions

Joshua Breslau designed and conducted the statistical analysis and drafted the manuscript.

Harold Pincus contributed to the design of the analysis and the interpretation of the findings and reviewed and commented on multiple drafts of the manuscript.

Grant Marshall contributed to the design of the analysis and the interpretation of the findings and reviewed and commented on multiple drafts of the manuscript.

Ryan Brown contributed to the design of the analysis and the interpretation of the findings and reviewed and commented on multiple drafts of the manuscript.

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Royal Commission into
Victoria's Mental Health System

ATTACHMENT RB-20

This is the attachment marked '**RB-20**' referred to in the witness statement of Dr Ravi Subramanya Bhat dated 4 July 2019.

THE UNIVERSITY OF
MELBOURNE

Department of
Rural Health

Crossroads II

A repeated population health study in Shepparton and Mooroopna 2016-2018

LISA BOURKE, KRISTEN GLENISTER & DAVID SIMMONS

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EXECUTIVE SUMMARY

The Crossroads II study is a population health study that repeats the original Crossroads I study undertaken in 2001-2003. Like the previous study, Crossroads II aimed to identify the health of residents of Shepparton and Mooroopna in 2016-2018 as well as their service use, access to services and rates of undiagnosed disease. Crossroads II was undertaken in partnership with nine local health services and local governments, Goulburn Valley Health, Primary Care Connect, Benalla Health, Cobram District Health, Seymour Health, Moira Shire, Goulburn Valley Primary Care Partnerships, Shepparton Access and Greater Shepparton City Council, as well as Alfred Health and the Department of Rural Health, The University of Melbourne, based in Shepparton and Wangaratta.

The study included a survey of 1,344 adults from 1800 randomly selected households (response rate 60%). This included households visited in the earlier study and additional randomly selected households from new neighbourhoods. All adults were asked to complete a questionnaire and adults were asked questions about all residents under 16 years of age. At the household, one adult was randomly selected and asked to attend a free 2-hour health screening clinic where a series of health assessments were conducted, including the Oral Glucose Tolerance Test, cholesterol, blood pressure and liver disease checks and measures of height, weight, heart function, hearing impairment, cognitive function, lung function and dental health. Together these results provide an overview of health, access to and use of services, and rates of undiagnosed disease with comparison to the results 15 years earlier.

While an older sample and more female, this study has gathered detailed information about the health of residents of Shepparton and Mooroopna. In this large, randomly selected study sample, self-rating measures of health and happiness were high. Respondents were happy with their GPs and generally happy with most service providers but were concerned about the costs of health care. Key health issues identified were chronic pain, disability, obesity, heart disease and high blood pressure. Findings also suggest that respondents could improve their vegetable intake, activity levels and consume fewer takeaway meals to improve their own health. Access issues were also identified, primarily associated with cost and waiting times.

The results of Crossroads II highlight what local services know are the key conditions and key issues in using health services. The results provide evidence of the observations of local health services and arm local services and consumers with information to address key issues. The key findings include:

- Residents of Shepparton and Mooroopna rate their own health higher than the state average and this was found in Crossroads I in 2001-2003.
- Study participants were happier than 15 years earlier.
- Levels of community participation were reported to be similar or slightly lower than 15 years earlier.
- Self-reported rates of smoking have declined and were below the state average; this suggests efforts to promote quit smoking in the region have been successful.
- Healthy eating could be improved. Like the consumption of alcohol, self-reported eating and drinking behaviours remained similar to 15 years earlier. Further, reported physical activity had increased and rates of obesity had also increased. There are significant efforts in Shepparton by Goulburn Valley Primary Care Partnerships, Primary Care Connect, Goulburn Valley Health and Greater Shepparton City Council to encourage healthy weights and improve eating patterns and physical activity among local residents, particularly children.
- The self-reported rates of chronic and long-term conditions were higher in this study than the previous study, including the proportion of respondents with eye problems, high blood pressure, arthritis, allergies, high blood fats, depression, hearing loss, skin conditions, digestive problems, respiratory problems, heart problems, cancer, thyroid trouble, osteoporosis, diabetes and circulatory problems. Multiple services, including Goulburn Valley Health, Primary Care Connect, Goulburn Valley Primary Care Partnerships and Greater Shepparton City Council, are working to promote healthy lifestyles and prevent chronic disease.
- Self-reported rates of depression had increased and levels of psychological distress were slightly higher than the state average. While use of mental health services has increased, these results suggests there is unmet demand for services. There are efforts by Goulburn Valley Health and other services to improve access to, and the quality of, mental health services.

- Service providers are aware of the high prevalence of chronic pain and Primary Care Connect and Goulburn Valley Health have clinics and projects to assist in better pain management.
- There is a significant proportion of residents reporting a disability; Shepparton Access and other services are aware of the extent of disability and provide services appropriately.
- 93% of respondents said they had visited a GP in the past 12 months and more respondents said they were able to see a GP within three days than in the Crossroads I study 15 years earlier.
- Use of medical specialists was reported to have increased over the past 15 years; Goulburn Valley Health has increased access to a range of medical specialists and this study suggests these services are used and appreciated.
- Satisfaction with GPs and medical specialists increased from the previous study.

Scrolling through this report provides specific data about key conditions and related issues and changes over the past 15 years. It is hoped this information can be utilised when needed to support projects, health interventions and access to funding to address the key issues.

In summary, this study suggests that health care, health prevention activities and healthy lifestyles could be improved and acknowledges that satisfaction with services have improved over the last 15 years. Further, many residents rate themselves as healthy and happy and responded positively about local health services. A range of local services are working on improving the health of the community, with a new Chronic Pain Clinic, healthy lifestyles programs in many health services and public health plans and programs working across the sector to prevent obesity, social isolation and chronic disease.

A final note is made about loneliness, as identified during data collection. There is a large proportion of residents in Shepparton and Mooroopna living alone with few social contacts. Some are fearful to go out, some struggle with physical mobility and others lack information, access, inclusion, motivation and enthusiasm to venture far from their homes. Rather, they spend a lot of time alone and were keen to chat with researchers about their health, their families and their lives. While this was not investigated in this study, attempts to engage those who do not go out and engage with others frequently by addressing their fear, mobility, access and interests would seem to be a worthwhile community initiative.

Given the findings, this study proposes three recommendations:

1. **Local services are needed and should be continued.** Local services are well used and needed by the community. The decrease in undiagnosed disease in the past 15 years suggests these services are screening and diagnosing key health conditions. The number and type of health services available in Shepparton and Mooroopna has increased; further new services in areas of need have been developed, including pain services, cancer services and other medical specialists. Support, funding and continuation of these services are important to local residents.
2. **Promote healthy living.** The increase in chronic and long-term conditions that prevent quality of life and healthy ageing call for a whole-of-community approach to promoting healthy lifestyles (see Allender et al., 2015). Promotion of physical activity, healthy diets and moderation of alcohol consumption are key to our community's health and wellbeing, both now and in the future. Expanding and integrating current strategies as well as engaging all sectors of the community in healthy living would provide a holistic approach.
3. **Address factors limiting local residents' ability to manage their health well.** Known as the social determinants of health (see WHO, 2019), addressing key issues in people's lives enables healthier living and improved access to health care for those who need it. This includes income, employment, education, housing, transport, social connection and social inclusion. Addressing these issues for residents with disability, chronic pain, mental ill-health and/or who are socially isolated as well as for residents who are marginalised due to low income, low English proficiency and other cultural barriers is important for overall health, wellbeing and inclusion. Like the previous recommendation, a whole-of-community approach is required that will (i) integrate current initiatives, (ii) develop improved environments for access, inclusion and participation, (iii) challenge exclusionary behaviours and language, and (iv) engage new sectors of the community so that Shepparton and Mooroopna can improve the quality of life and conditions of daily living for all local residents.

Report published May 2019

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INTRODUCTION

WHAT WAS THE STUDY ABOUT?

While it is well known that rural residents have less access to health services, lower rates of health service utilisation and poorer health outcomes, there is little accurate health data about specific rural places and populations (AIHW, 2017a; DHHS, 2017; Terry et al., 2015). This study was undertaken in partnership with health and community services in Shepparton and Mooroopna to provide these local services with improved understanding of the health of their population and assist in planning for services in the coming years.

Named Crossroads II, this study was undertaken in 2016–2018 and is a follow up from a baseline study conducted 2001-2003. The aim of Crossroads II was to identify the health of the residents of Shepparton and Mooroopna as well as their service use, access to services and rates of undiagnosed disease. Much of the information presented in this report draws on the perspectives of individuals about their own health because they are viewed as experts on their own lives. In addition, some clinical data was also collected. We hope this report provides useful information on service use, access to services and health generally for the residents, communities, and health services in Shepparton and Mooroopna.

METHODS

HOW WAS THE STUDY UNDERTAKEN?

1,344 participants

60% response rate

A total of 1,800 households were randomly selected in Shepparton and Mooroopna from a council list which included 1,422 households that participated in the original study (2001-2003). Of the 1,800 selected households, 1,553 were residential addresses eligible to participate. Ineligible addresses included those that had been changed from residential to business, were vacant at the time of being visited and those occupied by residents

343 local residents completed a 2-hour screening clinic

59% response rate

who had not lived in the locality for a minimum of six months. Trained research assistants approached each household in pairs to ask for participation in the study by all adults. Where residents were not home or the time was inconvenient, multiple follow up visits were made to contact all adults in the household. Adults were asked to complete an additional questionnaire for each child under the age of 16 years. Interviewers asked a set of questions about health conditions, service use, concerns about health care and other wellbeing, social participation and demographic questions. Using this method, 934 of the 1,553 eligible households participated in the questionnaire for a response rate of 60%. In these 934 households, 1,344 adults completed a questionnaire and a further 385 children's questionnaires were also completed.

For those households completing the questionnaire, a randomly selected person (using a random number generator at the household) was also invited to a health screening clinic. People under the age of 18 or pregnant women were ineligible to participate. The clinics were held at Primary Care Connect, Shepparton Medical Clinic and the Department of Rural Health, University of Melbourne in Shepparton. The clinics were timed around the Oral Glucose Tolerance Test, in which a fasting blood-test is taken, 75g of glucose is consumed and a second blood test is taken two hours later. A series of health assessments were conducted within the 2 hour period, including cholesterol, blood pressure, liver disease, height and weight, heart function, hearing impairment, cognitive function, lung function and dental health. Individuals attending were asked to fast the night before the clinic. At the conclusion of the clinic, participants were offered breakfast. A total of 580 participants were invited to the clinic and 343 attended and completed the clinic, resulting in a response rate of 59%.

Both the household survey and the clinics were conducted between October 2016 and October 2018. For more detail on the methods of this study, see Glenister et al. (2018).

Measures were largely based on the original Crossroads I study which was conducted in 2001-2003. In this earlier study, 3,566 adults were surveyed asking most of the same questions. Like the current study, households were randomly selected, visited by researchers who interviewed all adults and a parent/guardian was interviewed on behalf of children under 16 years of age. Clinics were also voluntary and run as a 2-hour screening clinic. These data are referred to for comparison to identify changes over the 15 year period.

Data were recorded into a large dataset and then cleaned and coded. Analysis of each question has been undertaken and an overview of findings is presented in this report. The figures presented are based on the number of respondents answering each question. In addition, differences between men and women, those born in and not born in Australia, and those who had completed secondary school were tested using a t-test or chi-square. Differences in age by year were tested using a Pearson's correlation. While most questions were tested for these differences, they are only reported where both a statistically significant difference and substantive differential was found. Further, results were compared to the earlier study and differences are noted where they were identified.

RESULTS

WHAT DID THE STUDY FIND?

Questionnaire Participants

A total of 1,344 adult residents of Shepparton and Mooroopna completed the questionnaire at their place of residence. Of these, 57% identified as female and 43% as male. Further, 2% identified as Aboriginal and/or Torres Strait Islander, which is an under-representation of the Aboriginal and Torres Strait Islander population in the region. Ages reported ranged from 16 to 97 with a mean (average) of 52 years (see Table 1). This suggests an older sample than the Australian population, in part because participants were aged 16 years and older.

Table 1: Age of Shepparton participants (n=1329)

Age	Frequency	Percent
16-29	205	15
30-39	188	14
40-49	188	14
50-59	214	16
60-69	273	21
70-79	167	13
80 or older	94	7

Almost two-thirds reported that they were married (56%) or de facto (8%), a slightly lower proportion than the earlier Crossroads study (61% and 7%, respectively). Further, 16% described themselves as never married, 7% indicated they were divorced, 5% reported they were separated and 7% indicated they were widowed. Education levels varied. 60% indicated they had completed Year 12 or higher and 47% said they had participated in some tertiary education. Overall, education levels had increased since the earlier Crossroads I study.

Table 2: Participants' highest level of education, in percent

Education Level	Crossroads I 2001-2003	Crossroads II 2016-2018	Victoria*
Year 8 or less	12	5	10
Year 9	21	8	
Year 10		14	8
Year 11		13	6
Year 12	36	13	16
TAFE or other tertiary	16	21	24
University Degree	15	26	24

**Source: ABS (2018) with 12% not stated/other*

Employment Status: Adults surveyed were asked about their employment status. While there was variation and many engaged in multiple employment situations (e.g., two part-time jobs, part-time work and study, etc.), 31% said they were primarily in full-time work, 18% reported working part-time (often casual) and 26% described themselves as retired. A further 6% reported 'home duties,' 4% said they were not working, 4% indicated they were not able to work and 6% indicated they were students, either full-time (5%) or part-time (1%). Others described their roles as 'carers,' 'transitioning to retirement,' 'working on and off' and doing 'volunteer work.'

Country of Birth: Most, 82%, responded that they were born in Australia. The remaining 18% said they were born in 37 different countries, most commonly India, United States, New Zealand, Philippines and Italy. For those indicating they were not born in Australia, almost one-quarter reported relocating to Australia in the past five years, half said they had lived in Australia for 11 years or less while one third reported living in Australia for 30 years or more. In the earlier study, 88% of Shepparton respondents said they were born in Australia and the remaining 12% said they were born in 57 different countries. The most common countries of birth identified in the earlier study, other than Australia, were England, Italy, Holland, Turkey and Scotland. This suggests that the cultural and ethnic background of the population has changed over the 15 years between the two studies.

Ethnicity: When asked about ethnicity, around eight in ten participants described themselves as European/Anglo/Caucasian. A further 5% described their ethnic background as South Asian, 2% described their ethnic background as Middle Eastern, 2% described their ethnic background as East Asian, 2% as other Asian, 1% as African, 1% as Polynesian and 1% as Pacific. When asked about ethnicity of their parents, 83% described their parents as European/Anglo/Caucasian and other ethnicities varied greatly. Most in the current study, 91%, reported that they spoke English at home while the remaining 9% spoke one of 25 different languages at home.

Length of residence: Respondents reported living in Shepparton for up to 88 years with a mean of 27 years and a median of 24 years. Just over half of respondents (55%) had lived in the same house for all the time they had lived in Shepparton or Mooroopna. A further 26% had lived in two houses and 10% had lived in three houses. Another 4% had lived in four houses and the remaining 5% had lived in 5 or more houses in Shepparton or Mooroopna.

Dwelling: When asked about their dwelling, 71% reported living in a house/unit that was owned and 23% reported living in house/unit that was rented while others said they were boarding or living with family or friends. This reflects a slight increase in home ownership from 2001 where 68% owned their dwelling and 22% rented.

Participants reported that most dwellings had three bedrooms (52%) or four bedrooms (30%). Most (60%) houses were said to be occupied by 2 adults and 22% said their house was occupied by one adult. A further 10% said the house was occupied by three adults and the remaining 6% were reported to have four or more adults living in the house. While slightly more than two-thirds of the households (68%) indicated they had no children under 16 years, the study found 12% had one child, 13% had two children, 5% had three children and 2% had more than three children living in the house.

Health Insurance: A total of 36% of participants responded they had no health insurance while 47% indicated they had some private health insurance, including 198 participants (15%) with minimal insurance and 431 (32%) with higher coverage. 307 respondents (23%) said they had a health care card, 171 or 13% indicated having an aged pension card and 16 respondents (1%) said they had insurance through Department of Veterans Affairs. It is important to note that some respondents had more than one of these. In the earlier study, 53% had no health insurance and 48% had some private insurance.

Previous Crossroads study: In the current study, 135 participants remembered participating in the 2001-2003 study, which is 13% of all those participating in both projects. Many of these 135 individuals remembered the clinic and talked clearly about their experience in the earlier study.

Clinic Participants

One adult from each household who had completed the household survey was randomly selected and invited to attend a free, comprehensive health check-up. In total, 343 people from Shepparton and Mooroopna attended a clinic. Of these, 45% were male and the average age was 57 years, although ages ranged from 18 to 88 years.

Social Participation

As indicated earlier, 1,344 adults answered a series of questions at their residence. Over half, 52%, of these adults described participating in a community club, group or organisation, most commonly a sporting club (slightly less than 55% in the earlier study). Groups identified ranged from sporting clubs and fitness groups to churches and religious groups, service clubs, community house groups, dance, craft, cooking and art groups to more specialised environmental groups, health and support groups and cultural groups. Of the 656 residents who respondents to this question, 317 said they participated in more than one community club, group or organisation. Some individuals participated in up to 8 groups. Of all participants, 25% said they participated in one group, a slightly smaller proportion than in the earlier study in 2001-2003, and 24% of all participants indicated being involved in more than one group, just less than 27% in the earlier study. Furthermore, of the 656 participating in groups and activities in the current study, 278 reported having a formal role in these clubs, groups or organisations. In addition, 388 respondents said they spent more than 10 hours per month involved with and volunteering for their club, group or organisation. This is 29% of all respondents which is slightly lower than 32% spending 10 hours or more 15 years earlier. This suggests the proportion of residents participating in local clubs, groups and organisations is similar or only slightly less than 15 years ago.

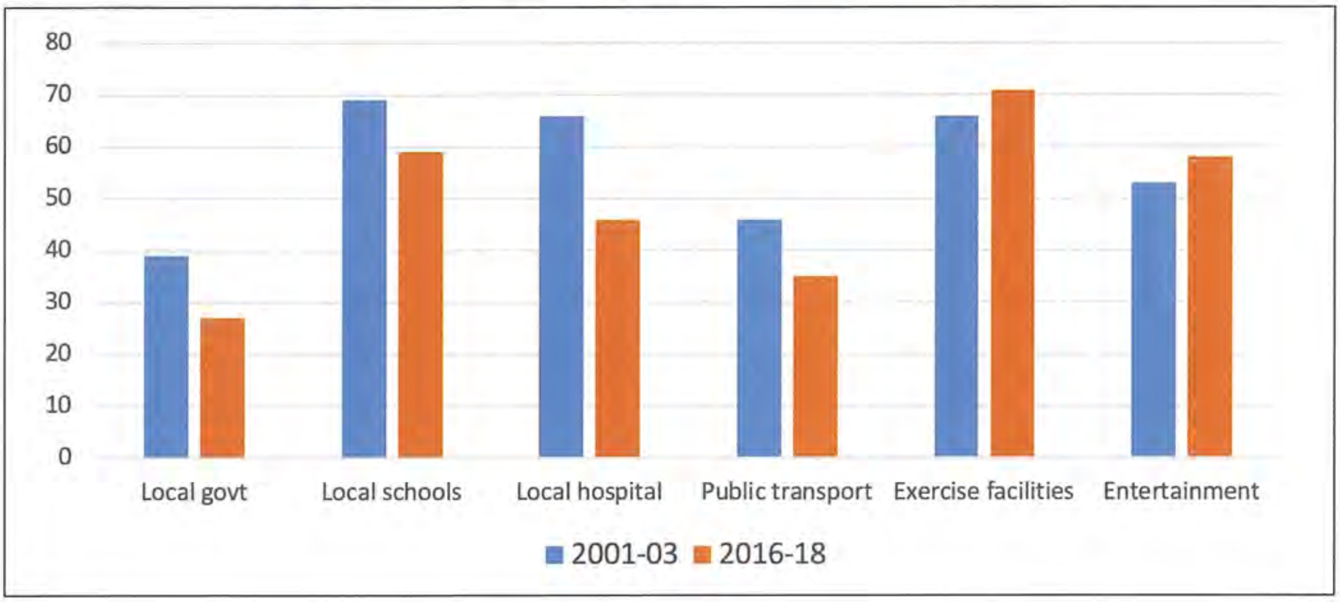
As another measure of social connection, participants were asked 'of the 10 houses closest to your home, how many have you been in? Older people were more likely to have been in more of their neighbours' homes. Respondents indicated:

- 26% had not been in any of these houses.
- 15% in one house
- 14% in two houses
- 13% in three houses
- 23% in 4-6 houses
- 9% in 7 or more households

A total of 343 adults from Shepparton and Mooroopna completed the clinic where they were asked how sorry or pleased they would be to leave the area. 71% suggested they would be 'very sorry' or 'somewhat sorry' to leave, slightly lower than the earlier study 15 years ago. A further 18% said it would make no difference while 11% indicated they would be 'pleased' or 'very pleased' to leave. In the earlier study, 74% said they would be very sorry or somewhat sorry to leave, 17% indicated it would make no difference and 9% responded they would be pleased or very pleased to leave.

Clinic participants were also asked to rate their level of satisfaction with local services (see Figure 1). Most were satisfied with the exercise facilities, schools and entertainment in the Shepparton/ Mooroopna areas. Satisfaction with local government, local hospitals and public transport rated lower and had declined over the past 15 years.

Figure 1: Percent of clinic participants satisfied with local services



General Health, Happiness and Wellbeing

82% rate their health good or better

Compared to adults in the state of Victoria, participants in this household survey rated their health better than the state as a whole (see Table 3). In Shepparton and Mooroopna, 50% rated their health as 'excellent or very good' compared to 42% in Victoria. In addition, 18% rated their health as 'fair' or 'poor' in Shepparton and Mooroopna compared to 20% of Victorian adults (DHHS, 2017). The results are similar to the findings in 2001-2003 for Shepparton and Mooroopna. Those born in Australia rated their health slightly better than those not born in Australia.

As a general assessment of health, the original EQ-5D scale was employed to measure health status (van Reenen and Janssen, 2015). As part of this measure, respondents were asked to rate their 'own health today' on a scale of 0-100. Their ratings of their own health ranged from 0 (one person) to 100 (83 people). Half of respondents rated their health above 80 and 20% rated their health over 90. This suggests that perception of one's own health varied among respondents.

Table 3: Self-reported health status by Shepparton and Mooroopna participants and Victorian residents

Rating of own health	Crossroads I 2001-2003 (%)	Crossroads II 2016-2018 (%)	Victoria (%) (DHHS, 2017)
Excellent	14	14	42
Very Good	35	36	
Good	35	32	38
Fair	13	13	20
Poor	3	5	
TOTAL	100	100	100

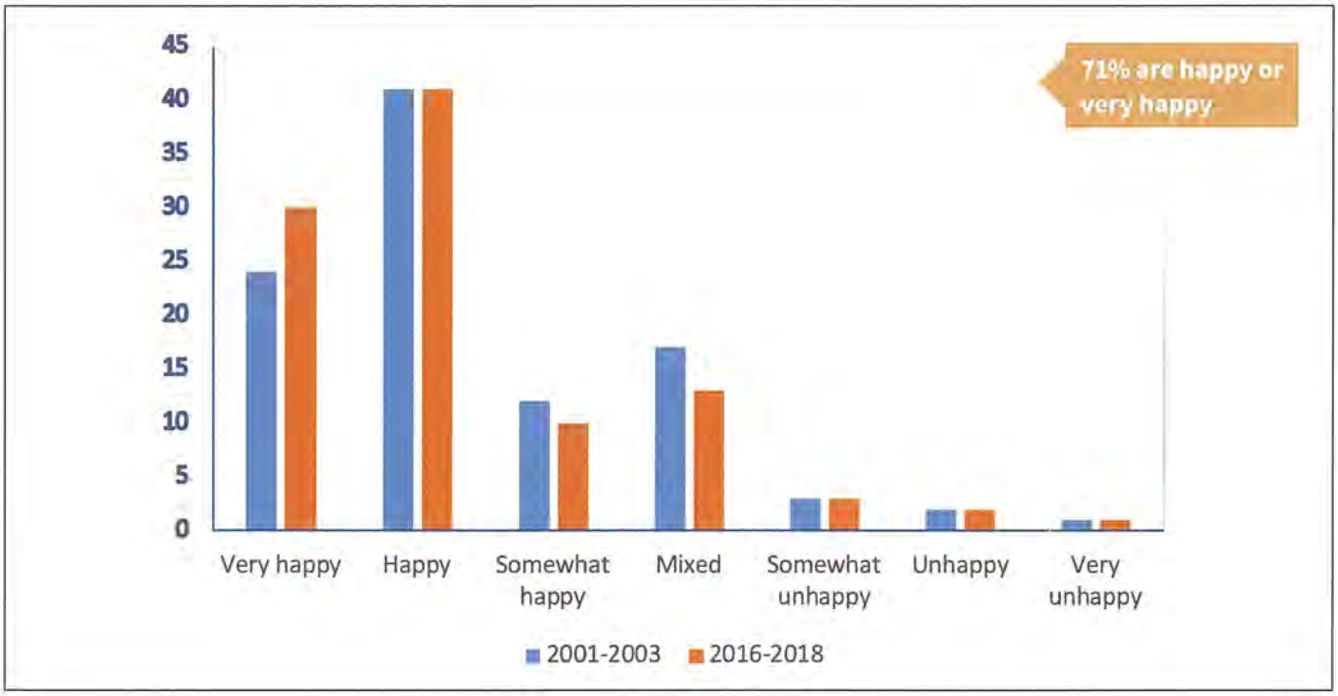
As another part of the EQ-5D, respondents were asked to rate whether five health dimensions were not a problem, a moderate problem or a severe problem (see Table 4). Few indicated problems with self-care and 81% reported 'no problems' with their usual activities. One quarter indicated that depression or anxiety and mobility were problematic and almost half reported that pain was problematic for them in daily living.

Table 4: Self-reported health problems reported by Shepparton and Mooroopna participants

	Not a problem	Moderate problem	Severe problem
Self-care	96	4	0
Usual activities	81	18	1
Anxiety or depression	75	20	5
Mobility	74	25	1
Pain or discomfort	54	42	4

The majority of respondents indicated they were happy or very happy (71%). A further 10% said they were 'somewhat happy,' 13% said they were 'mixed' (both happy and unhappy) and 6% indicated they were 'somewhat unhappy,' 'unhappy' or 'very unhappy' (see Figure 2). This is slightly higher than the earlier Crossroads study in 2001-2003 where 64% were happy or very happy.

Figure 2: How happy have you been in the past month, in percent



Mental Health

The Kessler-10 scale is routinely used to screen for psychological distress. Among the 343 clinic participants, 68% had a score indicating low levels of psychological distress, 13% had moderate levels of distress, 14% had high levels and 5% had very high levels of psychological distress. These results are slightly higher than for Victorian residents where 17% have high or very high levels of psychological distress (DHHS, 2017) compared to 19% in this study. Another measure of mental ill-health, the PHQ9 scale, found 31% of respondents to be psychologically at risk. This is higher than found in a study of GP patients in Australia where 24% were found to be psychologically at risk (Carey et al., 2014). Together these suggest residents of Shepparton and Mooroopna experience above average levels of psychological distress.

Obesity

Respondents were asked during the household survey to provide their height and weight. Using this self-reported information, Body Mass Index (BMI) was calculated using kg/m2. According to this self-reporting, it was found that:

- 1% were underweight (BMI less than 18.5)
- 31% were of a normal weight (BMI 18.5-24.9)
- 39% were overweight (BMI 25-29.9)
- 29% were obese (BMI 30 and over).

This is higher than the Victorian average where 30% were found to be overweight and 19% were identified as obese, and in rural Victoria where 31% were identified as overweight and 23% were classified as obese (DHHS, 2017). Further, there was no statistical association with age.

Those attending the clinic also had their height and weight measured by clinic researchers. At the clinic, higher BMIs were found. It was identified that 40% of clinic participants were overweight and 36% were obese. By gender, 86% of men had a BMI in the overweight or obese category and 71% of women were categorised as overweight or obese. The proportion of those classified as obese was higher than the 2001-2003 study (see Table 5). In the earlier study, men also had higher BMIs; 77% of men and 60% of women were identified as overweight or obese in the clinics.

Table 5: Participants overweight and obese, in percent

BMI Category	Clinical measures*	
	Crossroads I 2001-2003	Crossroads II 2016-2018
Overweight	42	40
Obese	26	36

** Height and weight were measured by researchers*

Waist circumference was also measured at the clinic and 79% of males were found to have a waist circumference of greater than the recommended threshold of 94cm, placing them at increased risk of chronic disease. Further, 87% of females had a waist circumference greater than the recommended 80cm. These percentages were higher than the 59% of males and 65% of females with waist circumferences over the recommended size reported by the national health survey (ABS, 2015).

Injury

A total of 14% of survey participants reported an injury that resulted in them staying away from work or school in the past 12 months. This is slightly higher than the previous study where 11% reported an injury in the past year that resulted in time away from work or school. These injuries occurred most frequently at home (33%), at work (30%) or while engaging in sport/recreation (20%). In the earlier study, the setting where the injury occurred was different with 46% at work, 20% during sport or recreation and 19% at home, highlighting a reduction in workplace injuries.

Over half (54%) of those with injury said they had stayed away from school or work for less than five days while 14% said they had not been able to attend work or school for over a month and 10% for over two months. These findings are similar to results 15 years earlier where 54% said they had stayed away less than five days, 13% indicated staying away more than a month and 8% for over two months. Furthermore, of those with injuries, 54% said they saw a GP while 20% reported attending the Emergency Department, 10% consulting a medical specialist and 16% said they did not consult a doctor. 16% of those with injuries reported being admitted to hospital. These rates of medical service use are higher than 15 years earlier where 39% of those injured said they went to a GP, 15% to the Emergency Department, 10% to a Medical Specialist while 14% indicated they sought no medical treatment.

Health Checks

Respondents were asked if they had undergone key health checks in the past two years (see Table 6). Blood pressure checks were reported to have been undertaken by 88%, just higher than in the earlier Crossroads study in 2001-2003. Other checks varied and were more age relevant. Compared to the previous study 15 years earlier, cholesterol, diabetes, bowel and prostate checks were reported to have increased while the proportion of women stating they had undergone a pap smear had decreased.

Table 6. Percent of participants reporting health screens in the past year

Health Check	Crossroads I 2001-2003	Crossroads II 2016-2018
Blood pressure check	84	88
Cholesterol check	48	68
Test for diabetes	50	64
Pap smear (women only)	68	50
Prostate check (men only)	29	43
Skin examination	32	39
Bowel examination	16	36
Mammogram (women only)	38	33

In the current study, older residents were significantly more likely to report having had all these health checks in the past two years, except for the pap smear among women. While women were slightly more likely to indicate having a blood pressure check, men were more likely to state they had a bowel or skin examination in the previous two years. Those born in Australia were more likely to indicate they had had a skin examination, mammogram, and pap test (women only) in the past two years. Those who had completed year 12 were more likely to report having a cholesterol or bowel check in the past two years.

Health Conditions

Respondents were also asked if they had ever suffered from any of the key conditions listed in Table 7. More information about specific health conditions is provided in the later sections of this report, specifically disability, chronic pain, heart disease and stroke, diabetes and respiratory conditions.

Older residents were more likely to report having heart problems, eye problems, hearing loss, cancer, high blood pressure, arthritis, osteoporosis, high cholesterol, and experiencing a disability. Women were more likely to report being diagnosed with osteoporosis and slightly more likely to report digestive issues, eye problems, thyroid trouble, allergies, asthma, depression and chronic pain. Men were slightly more likely to report heart and hearing problems. Those born in Australia were slightly more likely to indicate having digestive problems, kidney disease, liver disease, hearing loss, skin conditions, eye problems, high blood pressure and arthritis. Those participants who had completed Year 12 or further education were less likely to report heart, circulatory, digestive or eye problems as well as less likely to say they experienced hearing loss, cancer, disability, high blood pressure, arthritis, osteoporosis, high cholesterol, depression or chronic pain.

Table 7. Percent of participants reporting diagnosis of specific conditions

Health Condition	Crossroads I 2001-2003	Crossroads II 2016-2018
Eye problems	33	72
High blood pressure	21	34
Arthritis	17	31
Allergies	15	28
High blood fats	7	24
Depression	11	22
Chronic pain	NA	22
Hearing loss	11	20
Skin conditions	14	20
Asthma	16	19
Digestive problems	10	18
Disability	NA	18
Heart problems	8	14
Respiratory problems	5	13
Cancer	8	13
Thyroid trouble	4	9
Osteoporosis	3	9
Diabetes	5	9
Circulatory problems	4	7
Major infections	4	4
Kidney disease	4	4
Liver disease	1	3
Stroke	2	3
COPD	1	2
Epilepsy	1	1

Compared to the earlier study, the proportion of participants reporting experience of these conditions had generally increased over time (see Table 7). Major infections, kidney disease and epilepsy were the only conditions reported to have not have an increased over this time and these remained the same proportion.

In the current study, when asked about 'other' conditions (not in Table 7) suffered by respondents, a diverse range of conditions were mentioned. The most common were:

- Migraines (21 respondents)
- Back problems (19 respondents)
- Hip and Knee problems (15 respondents)
- Anxiety (13 respondents)

Health Behaviours

Diet

Respondents were asked how many serves of fruit, vegetables and dairy products they ate each day (see Table 8). When asked about diet, 11% reported eating the recommended 5 serves of vegetables or more per day. Half reported eating two serves of vegetables or less daily. This is above the state average and similar to reported consumption of vegetables in Shepparton and Mooroopna in the earlier study in 2001-2003. Older people and those who had completed Year 12 were slightly more likely to indicate eating more vegetables.

Table 8: Consumption of Vegetables by respondents, in percent

Number of serves	Crossroads I 2001-2003	Crossroads II 2016-2018	Victoria – rural*	All of Victoria*
Less than 1	1	4	6	7
1	21	18	57	59
2	51	29		
3		24	28	24
4	23	14		
5		7	8	7
6 or more	4	4		

**Source: DHHS (2017)*

Almost six of every 10 respondents (59%) reported eating the recommended daily intake of fruit (two or more serves) (see Table 9). This is similar to the proportion identified in the earlier Crossroads study and higher than the average in Victoria.

Table 9: Consumption of Fruit by respondents, in percent

Number of serves	Crossroads I 2001-2003	Crossroads II 2016-2018	Victoria – rural*	Victoria*
Less than 1	4	12	55	55
1	41	29		
2	45	38	44	43
3		14		
4	8	4		
5		2		
6 or more	2	1		

**Source: DHHS (2017)*

The recommended daily intake of dairy products, depending on gender and age, is 2.5–4 portions per day (NHMRC, 2013). The proportion of respondents stating they do not eat the recommended daily intake of dairy products was slightly higher than in Crossroads I (see Table 10).

Table 10: Consumption of Dairy products by respondents, in percent

Number of serves	Crossroads I 2001-2003	Crossroads II 2016-2018
Less than 1	3	12
1	33	29
2	52	36
3		15
4	10	5
5		2
6 or more	2	1

Respondents were also asked the quantity of sweetened drinks consumed the day before the survey. Two-thirds said they did not drink any sweetened drink and a further 23% indicated drinking 400ml (an average can of soft drink) or less. The remaining 12% said they drank more than 400ml of soft drink. Specifically, proportions of respondents drinking sweetened drinks were reported as:

- 65% did not consume a sweetened drink
- 9% consumed less than 200ml (eg, small juice bottle)
- 14% consumed 201-400ml (eg, can of soft drink)
- 5% consumed 401-600ml
- 3% drank 601-800ml
- 2% drank 801-1,000ml
- 2% drank more than a litre

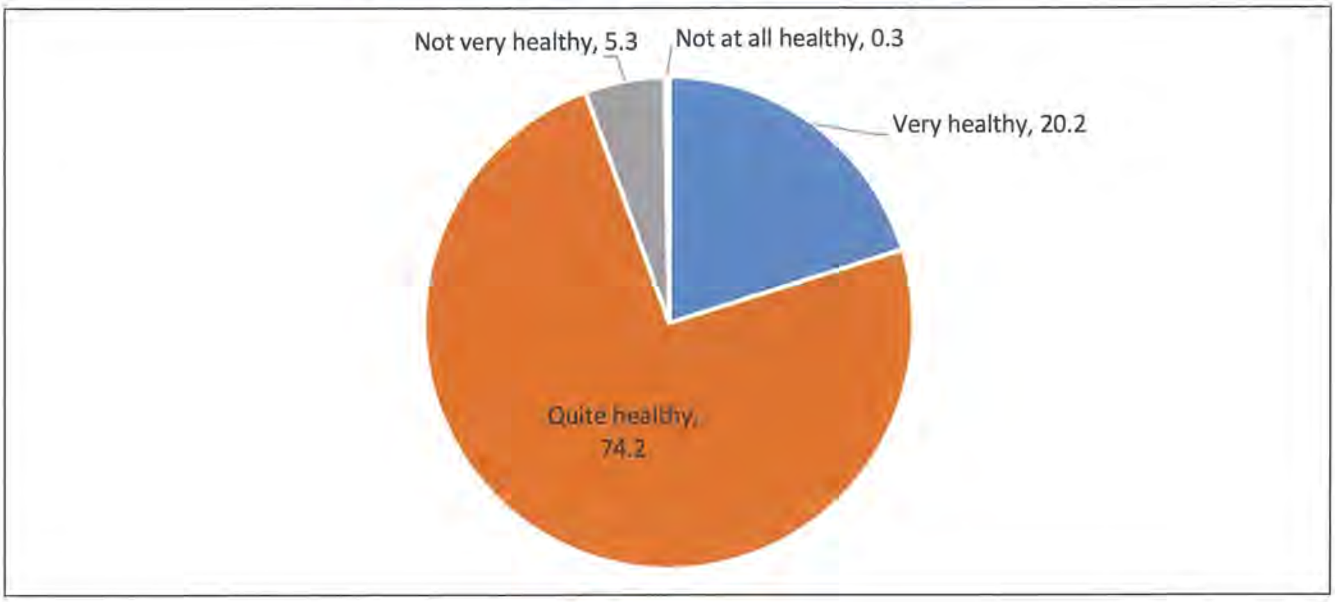
Respondents were asked how often they ate takeaway food as a main meal (see Table 11). 16% said they ate take away food several nights per week and 27% indicated eating take away food weekly. This is an increase in the reported consumption of takeaway food as a meal since the earlier study. Younger people were more likely to indicate eating takeaway meals more often.

Table 11: Participants reporting eating takeaway food as a main meal, in percent

How often?	Crossroads I 2001-2003	Crossroads II 2016-2018
Never	8	5
Less than once a month	30	25
2 – 3 days a month	30	27
1 day per week	31	27
2 - 3 days a week		14
4 – 6 days a week	1	2

At the clinic, participants were asked 'How healthy is the food you eat?' (see Figure 3). Most rated their diet as 'quite healthy.' In another question, most participants (97%) correctly answered that people should eat multiple serves of fruit per day while fewer participants (52%) correctly answered that people should eat multiple serves of vegetables per day.

Figure 3: Perceptions of one's diet by clinic participants



Alcohol

When participants were asked if they drink alcohol, 37% reported that they did not and 63% indicated that they drank alcohol. This is a slight reduction in self-reported alcohol consumption from the 2001-2003 study where 65% reported drinking alcohol. In the current study, participants born in Australia were more likely to report drinking alcohol.

Of those drinking, a quarter said they drank one drink or less per week, another quarter indicated they drank between two and four drinks per week, another quarter reported drinking 5-9 drinks per week while 25% said they drank 10 or more drinks per week (see Table 12). Women, those who had completed Year 12 and those born in Australia tended to indicate they drank fewer drinks each week.

Table 12: Percent of participants reporting number of drinks consumed each week among those who consume alcohol

How often?	Crossroads I 2001-2003	Crossroads II 2016-2018
One or less drinks per week	52	25
2-4 drinks per week		26
5-9 drinks per week	19	24
10-14 drinks per week	16	13
15-21 drinks per week	7	7
22 or more drinks per week	6	5

When asked 'how many times in the past month you have had five or more drinks within a couple of hours?', two thirds reported they had not while 14% said on one occasion, 10% said 2-3 times and 10% said four times or more. A total of 14 respondents reported having five or more drinks in a few hours 10 times in the past month, including eight who consumed this amount 20 or more times and 4 reporting consuming this daily.

When asked the type of alcohol, a third said beer (including 7% drinking only light beer), 46% responded wine and 17% indicated spirits. Others said they drank a combination of these drinks, cider or fortified wines. This is an increase in wine consumption from the 2001-2003 study where 39% said they drank beer (14% drinking only light beer), 34% reported wine and 24% said spirits.

A further 343 completed the screening clinic. Almost a quarter (23%) indicated that they had consumed 5 alcoholic drinks or more on a single occasion in the past month.

Smoking

A total of 14% of the survey participants reported that they smoked. Younger people were slightly more likely to report smoking. Among the clinic participants, 11% indicated they currently smoked. The proportion of smokers in this study is lower than the state average of 19% (DHHS, 2017) and a decline since the 2001-2003 study where 22% indicated they were current smokers.

14% smoke

Of the 182 who smoked, they reported smoking between less than one and 60 cigarettes per day. Ninety-five (52%) reported smoking 10 cigarettes or less daily, 71 identified smoking 11-20 daily, 10 reported smoking 21-30 daily and 6 said they smoked 31-60 each day.

In the current study, 59% of respondents indicated they had never smoked and 27% reported being ex-smokers. In 2001-2003, 63% indicated they had never smoked and 15% were classified themselves as ex-smokers. Among survey participants in the current study, 345 reported that they had quit smoking. Some reported quitting in the past year while others reported quitting up to 70 years ago. Half had quit 20 or more years ago.

Physical Activity

A total of 71% reported participating in physical activity compared to 61% in the 2001-2003 study. Table 13 presents the frequency of physical activity for those who were physically active. The type and length of exercise varied. Some played golf, some walked, others did yoga or pilates while others played sport, went to the gym, rode bikes, ran or engaged in cardio activities. One third reported normally exercising for 30 minutes or less (18% for less than 30 minutes and 14% for 30 minutes). Half said they normally exercised between 30 and 60 minutes (20% for 31-59 minutes and 29% for 60 minutes) and 19% reported normally exercising for more than one hour each session.

Of the 343 adults completing the screening clinic, over half (59%) were not achieving the recommended 150 minutes per week of exercise. This is similar to the percentage reported by the Australian health survey 2011-2012 (56%) (ABS, 2013a).

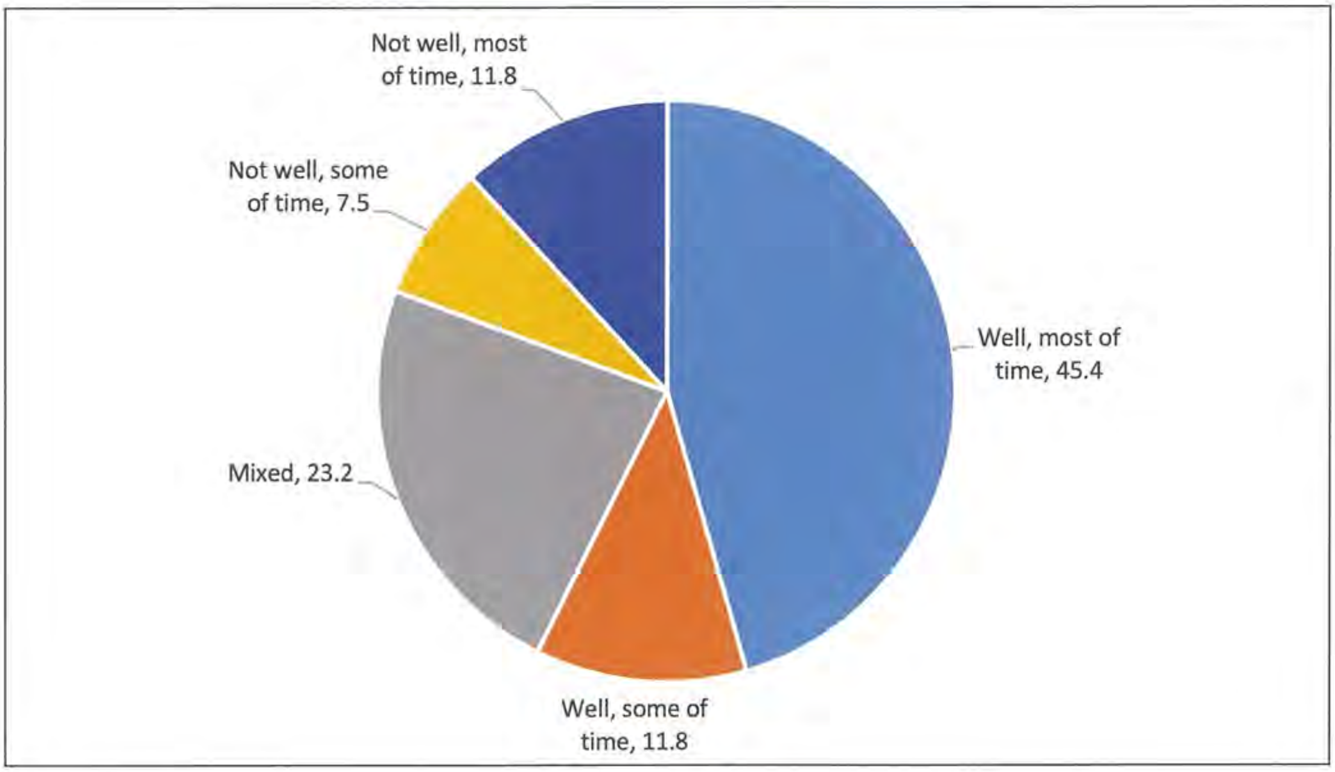
Table 13: Frequency of physical activity per week among respondents who engaged in physical activity, in percent

How often do you participate in physical activity?	Crossroads I 2001-2003	Crossroads II 2016-2018
Daily	23	25
5-6 days per week	4	22
3-4 days per week	48	33
1-2 days per week	25	20

Sleep Quality

Participants at the clinic were also asked 'How would you rate your usual sleep?' Figure 4 suggests that most clinic participants (57%) described sleeping well most or some of the time while 19% reported not sleeping well at least some of the time.

Figure 4: Ratings of sleep quality by clinic participants



Other behaviours

Sun protection: When asked about sun protection, 34% reported that they always use sun protection, 25% said they usually use sun protection, 20% said sometimes, 7% responded seldom and 10% reported never. Another 4% said they did not go out in the sun. Respondents used a range of sun protection measures, most commonly hat, sunglasses and sunscreen. This is similar to the previous study where 32% reported always using sun protection, 32% said they usually use sun protection, 21% responded sometimes, 7% said seldom and 6% reported never.

Television Watching: Clinic participants watched an average of 12.9 hours of television per week (range of 0 to 74 hours per week). This is similar to the average hours of television watching in 2001-2003 of 13.1 hours per week.

Immunisations: 94% of respondents indicated they had been immunised for childhood diseases. This is an increase from 86% in the earlier study.

Tetanus booster: 64% indicated they had had a tetanus booster in the past 10 years. This is the same proportion as in the previous study.

Pneumonia vaccine: 23% reported they had had a pneumonia vaccine in the past 5 years. This is an increase from 2001-2003 where 12% reported having had the pneumonia vaccine in the past 5 years.

Flu vaccine: 56% indicated they had had a flu vaccine in the past year. This is higher than in the earlier study where 32% indicated they had had a flu vaccine in the past 12 months.

Use of Services

GP Services

Of those surveyed, 1,249 or 93% of respondents said they had visited a GP in the past 12 months, similar to findings in the 2001-2003 study. Those under 30 years of age and women were more likely to have not seen a GP in the past year. Most or 78% of respondents said they saw a GP within three days of making an appointment; 39% indicated they saw the GP on the same day, 18% the next day, 14% on the second day and 7% on the third day after making the appointment. These findings suggest that slightly more patients see a GP within three days than in the earlier study (2001-2003).

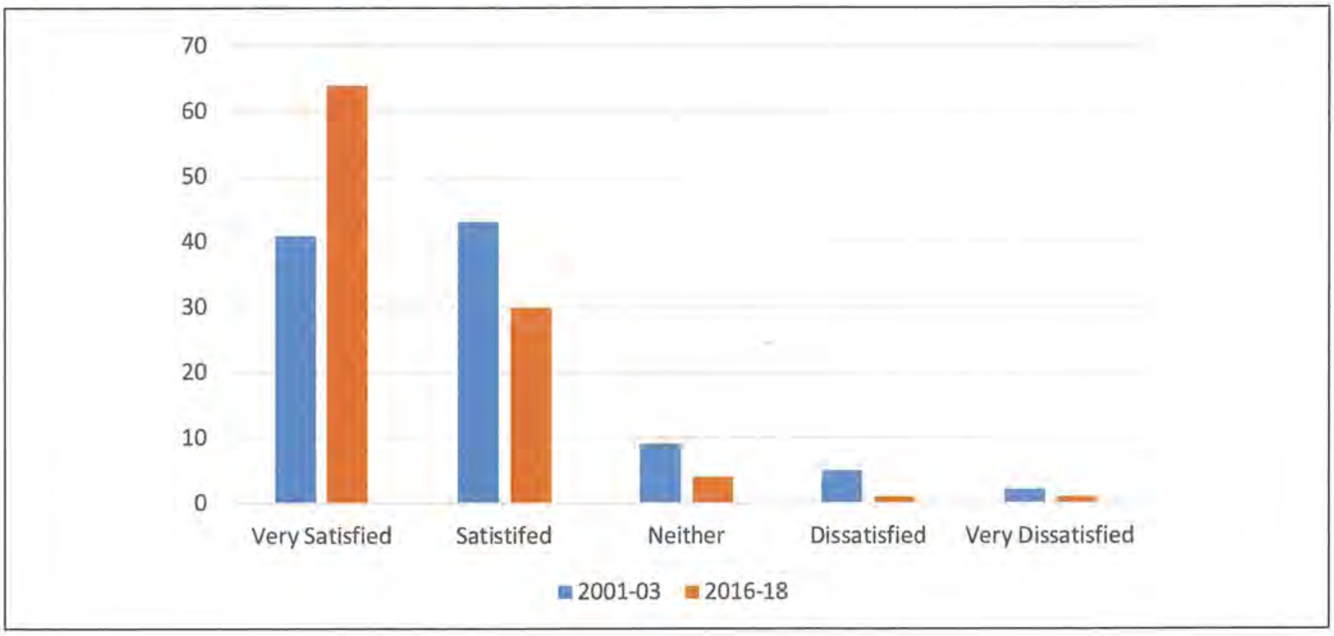
Respondents also indicated that they see up to 10 different GPs, with half (50%) reporting that they see 1 GP, a third (32%) see 2 GPs, 13% see 3 GPs and 5% state they see 4 or more GPs. Most visited a GP in Shepparton or Mooroopna while 45 respondents (3% of all participants) indicated they had not used a GP in Shepparton/Mooroopna in the past year; these respondents had used a GP in a small town locally, a regional centre (Albury or Bendigo) or Melbourne in the past year. In all, 68% said they were bulk-billed by their GP. Respondents varied in the number of times they had visited their GP in the past year (see Table 14). Many said they went once or twice, some reported attending monthly or more and a few reported weekly or more visits. This is a general increase in reported GP utilisation since 2001-2003.

In addition, most were satisfied with their GP. The survey identified that 64% reported they were 'very satisfied', 30% were 'satisfied' and only 2% were 'dissatisfied' or 'very dissatisfied' with their GP. These levels of satisfaction are higher than in the earlier Crossroads study where 41% indicated they were 'very satisfied,' 43% were 'satisfied' and 7% were 'dissatisfied' or 'very dissatisfied' (see Figure 5).

Table 14: Number of time participants visited a GP in the past year, in percent

Visits to GP in past 12 months...	Crossroads I 2001-2003	Crossroads II 2016-2018
Once	20	11
Twice	21	19
3 times	14	15
4 times	14	14
5 times	5	8
6 times	8	9
7-10 times	6	8
11-12 times	7	9
13 or more times	5	7

Figure 5: Satisfaction with GP in percent, 2001-3 and 2016-8



When participants were asked about confidence in their GP's ability:

- 49% responded 'excellent'
- 35% said 'very good'
- 12% reported 'good'
- 3% indicated 'fair'
- 1% responded 'poor'

96% rated confidence in their GP as good or better

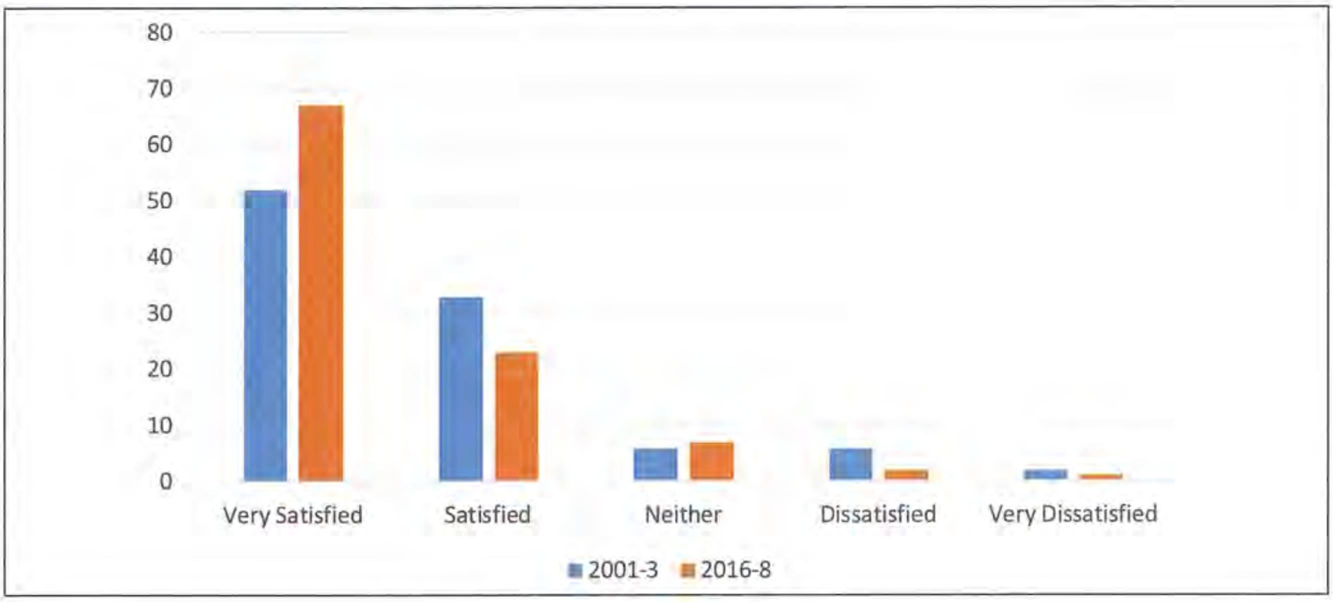
Medical Specialists

Of those surveyed, 587 or 44% responded they had visited a Medical Specialist in the past year and 188 respondents had seen more than one Medical Specialist. They were more likely older participants. This is an increase from Crossroads I where 28% had visited a medical specialist in the past year. In the current study, the type of medical specialists varied and respondents indicated they were seen locally as well as in Melbourne, Albury, Bendigo, Benalla, Echuca, Wangaratta and other centres. In the previous study, most consulted specialists in Shepparton or in Melbourne.

In the current study, most participants (63%) said they had seen a medical specialist once or twice in the past year with an additional 15% indicating they see a specialist 3 times and another 10% stating they see a specialist 4 times a year. The remaining 12% said they had seen a medical specialist between five and 60 times in the past year. This is similar to the study 15 years earlier where 67% of responded seeing a medical specialist 1-2 times in the past year, 12% seeing a specialist 3 times, 10 seeing a specialist four times and 11% seeing a specialist 5-49 times in the past 12 months.

Respondents indicated that waiting times to see the medical specialist ranged from seeing them the same day to waiting a year or more. Half said they saw the medical specialist within 20 days of making an appointment and 88% indicated they saw the specialist within three months. 90% were 'very satisfied' (67%) or 'satisfied' (23%) with the medical specialist while 3% were 'dissatisfied' or 'very dissatisfied'. This is higher than the earlier study where 52% were 'very satisfied', 33% were satisfied and 10% were 'dissatisfied' or 'very dissatisfied' (see Figure 6).

Figure 6: Satisfaction with medical specialists, in percent (2001-3 and 2016-8)



Hospital

Respondents indicated that 202, or 16%, had been hospitalised in the past 12 months, most only once. Three quarters said they stayed six nights or less. Most, 73%, were reported being hospitalised in Shepparton and a further 19% said they were hospitalised in Melbourne. Respondents who were hospitalised were asked if they were satisfied with the medical care, nursing care and their overall satisfaction; most were 'satisfied' or 'very satisfied' (see Table 15). Satisfaction with nursing care and overall satisfaction have increased since Crossroads I.

Table 15: Satisfaction with hospital care by those hospitalised in past year, in percent

Type of care	Very dissatisfied or dissatisfied		Neither dissatisfied or satisfied		Very satisfied or satisfied	
	2001-3	2016-8	2001-3	2016-8	2001-3	2016-8
Medical Care	8	7	4	5	88	88
Nursing Care	7	3	4	2	89	95
Overall Satisfaction	6	4	7	4	87	92

When asked in an open-ended question about concerns with in-patient care, half had no concerns, 10% said they 'didn't know' or had not used the hospital and a further 7% made positive comments. Issues were raised about quality of care (54 respondents), a lack of empathy (28 respondents), inexperienced health professionals (24 respondents) and lack of staff (24 respondents).

Emergency Department: Overall, 220 participants or 17% reported using an Emergency Department (ED) in the past 12 months. All but 10 said they had used the ED at Goulburn Valley Health in Shepparton. Most responded using the ED once. Half said they were provided with follow-up information at the end of their visit to ED. When asked how long they spent in ED (see Table 16), most said they spent 3 or more hours and half indicated they waited less than an hour to see a doctor. Waiting times to see a doctor increased slightly since the previous study in 2001-2003.

Table 16: Reported hours waited in the Emergency Department, in percent

Time	Total time in ED		Waited in ED to see Doctor	
	2001-2003	2016-2018	2001-2003	2016-2018
less than one hour	12	5	56	49
1-3 hours	31	19	29	22
3-6 hours	35	30	13	16
6 or more hours	22	46	2	13

When asked in an open ended question to identify concerns about participants' experience with ED, 19% had no concerns, another 7% cited positive comments about the local ED, and 7% said they did not know or had not used ED. Concerns mentioned most frequently included:

- waiting to get seen (451 respondents)
- poor patient care (111 respondents)
- negative stories heard from others, eg. 'heard you shouldn't go there' (78 respondents)
- lack of staff (57 respondents)
- too many using ED as a GP clinic (31 respondents)
- discharge concerns, including discharging too early (24 respondents)

Outpatient Clinics: A total of 223 or 17% reported using outpatient clinics in the past 12 months. This is higher than 11% found in the 2001-2003 study. In the current study, 133 respondents said they had used the outpatient clinics more than once in the past year, including 41 respondents who reported using it twice, 21 using it three times, 24 using it four times, 18 using it five or six times and 29 respondents who said they used outpatient clinics seven or more times. When asked about satisfaction with their visit/s, of those who had used outpatients, 51% were 'very satisfied' and 32% were 'satisfied' while 8% were 'dissatisfied' or 'very dissatisfied'. In the earlier study, of those using the outpatient clinic, 31% were 'very satisfied' and 37% were 'satisfied' while 20% were 'dissatisfied' or 'very dissatisfied'. Therefore, satisfaction with outpatient clinics has increased in the past 15 years.

Day Surgery: Of the Shepparton and Mooroopna respondents, 233 (17%) reported experiencing a day surgical procedure in the past year. These respondents were more likely to be older, born in Australia and to not have completed Year 12. The proportion using day surgery is higher than 9% identified in the 2001-2003 study. Like the earlier study, the majority of these day surgeries were undertaken in Shepparton, with 52 individuals reporting going to Melbourne, Numurkah, Kyabram, Benalla, Wangaratta, Albury, Bendigo or elsewhere for their day procedure. In the previous study, most had day surgery in Shepparton or otherwise Melbourne and a few in Kyabram.

Of those using day surgery, 73% of participants in the current study indicated having one surgery. A further 17% said they had two day surgical procedures, 6% said they had three procedures and another 4% participants reported having more than three day surgical procedures. This is higher than the earlier study where, of those having a day surgical procedure, 83% indicated one in the past year, 10% responded two, 3% said 3 and 2% identified more than three procedures. In terms of waiting times, in the current study nearly all of the 233 indicated they had waited two months or less. Furthermore, 91% reported they were 'very satisfied' (67%) or 'satisfied' (24%) while 5% were 'dissatisfied' or 'very dissatisfied' with their day procedure/s. These findings suggest satisfaction with day surgery has improved from 2001-2003 where 80% reported being satisfied and 12% indicated they were dissatisfied.

Ambulance

90 respondents (7% of all survey participants) indicated they had used an ambulance in the previous 12 months, more often older participants. 81 of these 90 respondents said they had used an ambulance in Shepparton or Mooroopna. 60 responded using an ambulance once while 10 indicated using an ambulance twice, 10 three times and 8 respondents said they had used an ambulance four times or more. Reported waiting times ranged from a few minutes to four hours with 76 respondents indicating the ambulance arrived within one hour and seven others were unsure how long the ambulance took to arrive. Of those using an ambulance, 91% were 'very satisfied' (69%) or 'satisfied' (22%) while 1% were 'dissatisfied' and 6% were 'very dissatisfied'. In the earlier study, 5% of respondents indicated using an ambulance in the past year of which 90% were satisfied and 4% were dissatisfied.

Pharmacist for Advice

In all, 389 respondents (29%) said they had sought out a pharmacist for advice in the past year. Two thirds of the 389 indicated using a Pharmacist for advice once or twice while others sought advice monthly and for a few fortnightly or weekly. In the 2001-2003 study, 16% reported seeking advice from a pharmacist in the past year. Among these, 31% had sought advice once, 25% twice, 17% 3-4 times and 22% more than four times.

Dentist

Half of respondents indicated they had been to the dentist in the past year and 69% within the past two years. Table 17 presents more detail about the length of time since the most recent use of dental services. Compared to the earlier study, more respondents indicated they had consulted a dentist in the past two years.

Table 17: Frequency of how long since last dentist visit, in percent

How long since dental visit...	Crossroads I 2001-2003	Crossroads II 2016-20018
within 3 months	17	19
4-6 months	14	13
7-12 months	15	18
1-2 years	18	19
more than 2 years ago	35	28
Never	1	3

In 2016-2018, many indicated that they visit or consult a dentist when needed, however reasons given for not visiting a dentist included, in order of most common reasons: no need, cost, have dentures, fear, apathy and time. Travel, availability, quality of the dentist and choice were not identified by many respondents as reasons not to visit the dentist.

Registered Nurse

168 respondents (13%) reported seeing a registered nurse in the past year. Compared to the earlier study, this is higher than the 3% reporting seeing an RN in the past year in 2001-2003.

Optometrist

632 respondents or 47% reported visiting an optometrist in the year prior to the survey. Of these, 80% said they had visited the optometrist once in the past year and another 14% had visited the optometrist twice. They were more likely to be older and female participants. The 2001-2003 study found that 22% had visited an optometrist in the past year.

Movement/muscle therapies

Physiotherapist: Of those surveyed, 17% reported using a physiotherapist in the past year. This is higher than in 2001-2003 where 9% indicated they used a physiotherapist in the previous 12 months. While 229 respondents reported visiting a physiotherapist in the current study, the number of times varied (see Table 18). They were more likely to have higher BMIs.

Table 18: Among physiotherapy users, number of visits in the past year, in percent

Of those using a Physiotherapist, number of visits in past 12 months...	Crossroads I 2001-2003	Crossroads II 2016-20018
Once	22	17
Twice	16	21
3 times	15	13
4 times	10	11
5 times	6	11
6 times	6	9
7-11 times	9	8
12 or more times	16	10

Exercise Physiologist: Of the survey respondents, 28 (2%) reported consulting an exercise physiologist in the past 12 months. Of the 28 respondents who had used an exercise physiologist, the number of times varied from once to weekly (52 times) with three-quarters visiting the exercise physiologist up to seven times.

Osteopath: A total of 101 (8%) said they had visited an osteopath in the past year. Of the 101 using an Osteopath, 19 said they had used the service once, 24 said they had used it twice, 23 had used it three or four times and 35 reported using the service between five and 26 times in the past year. They were more likely to be women, born in Australia and have completed Year 12.

Speech Therapist

Eight respondents (0.6%) said they had visited the speech therapist in the year prior to the survey. Of these nine, five responded they had visited the speech therapist once and the other four said they used the service 2 or 3 times. In the 2001-2003 study, 0.2% indicated they had visited a speech therapist in the previous year.

Audiologist

A total of 206 respondents (15%) said they had visited an audiologist in the prior year, more often older participants. Most, 162 of these respondents, indicated using the audiologist once and another 30 said they had visited the audiologist two or three times in the past year. In the 2001-2003 study, 3% reported visiting an audiologist in the previous year, usually one time.

Podiatrist

127 participants (9%) reported that they visited the podiatrist in the previous year. They were more likely to be older participants.

Aboriginal Health Services

13 respondents or 1% responded that they had used Aboriginal Health Services in the previous 12 months. In the previous study, 0.6% were found to have used an Aboriginal Health Service in the last year.

Mental Health and Wellbeing Services

Mental health services were reported to be used by 161 respondents. 89 or 7% of all respondents said they had seen a psychologist and 38 or 3% reported seeing a psychiatrist. Furthermore, 48 or 4% reported seeing a social worker and

22 or 2% said they had seen a welfare officer in the past year, which could be for mental health, wellbeing or welfare issues. In addition, 37 or 3% reported they had seen *another mental health professional,* mostly a counsellor at one of the local agencies (including headspace, The Bridge, Family Care, CASA, GV Area Mental Health, Primary Care Connect or while in hospital). These participants were more likely women, younger and had completed year 12. Satisfaction with these *other mental health services* was lower than for psychologists and psychiatrists, with 73% 'very satisfied' (62%) or 'satisfied' (11%) while 14% were 'dissatisfied' or 'very dissatisfied'.

In the 2001-2003 study, 3% were found to have seen a psychologist or psychiatrist (10% in the current study). In the earlier study, most (79%) had used these services in Shepparton and some (17%) had travelled to Melbourne. Half had used these services four or more times in the past year.

Psychologist: 89 (7%) respondents indicated they had used a psychologist between one and 52 times (weekly) in the past year. Half of these respondents said they had seen a psychologist three or fewer times while 14 reported seeing a psychologist 12 or more times (at least monthly). 78 suggested they waited a month or less for their first appointment while 11 indicated waiting between 42 and 120 days for their first appointment. All but 14 said they saw a psychologist in Shepparton or Mooroopna with seven seeing a psychologist in Melbourne. Most (90%) were either 'very satisfied' (55%) or 'satisfied' (35%) with the psychologist while 8% were 'neither satisfied or dissatisfied' and 2% were 'dissatisfied'. Those seeing a psychologist were more likely to be women and younger people.

Psychiatrist: A total of 38 (3%) respondents said they had visited a psychiatrist in the past year, of which 28 reported seeing a psychiatrist in Shepparton and nine indicating using a psychiatrist in Melbourne. 32 of the 38 said they obtained an appointment within a month. 26 respondents were 'very satisfied' (16 respondents) or 'satisfied' (10 respondents) while 3 were 'dissatisfied' and 4 were 'very dissatisfied'.

Social Worker: Of the 48 (4%) respondents who said they had seen a social worker, 17 responded seeing the social worker once, 15 seeing them 2-4 times, 8 seeing them 5-11 times and 8 saying they had seen the social worker 12 or more times (at least monthly). While 4% indicated they had seen a social worker in the 2016-2018 study, 2% identified seeing a social worker in the 2001-2003 study, usually once or twice.

Alternative Health

Acupuncture: Of all respondents, 61 or 5% said they had used an acupuncturist in the previous year. 22 respondents reported using an acupuncturist once or twice, 15 reported using the service between three and five times, 17 reported using an acupuncturist six to 10 times, and seven reported using it 12 or more times (monthly). In the 2001-2003 study, the same proportion, 5%, indicated they had seen an acupuncturist in the past year.

Chiropractor: Of those surveyed, 199 respondents (15%) said they had visited a chiropractor in the past 12 months. Those using a chiropractor were more likely to have been born in Australia.

The number of visits ranged from once to 26 times (fortnightly), with respondents reporting the following use of a Chiropractor:

- 56 respondents using a Chiropractor once
- 38 using a Chiropractor twice
- 21 using a Chiropractor three times
- 17 using a Chiropractor four times
- 29 using a Chiropractor five or six times
- 21 using a Chiropractor seven to 11 times
- 17 using a Chiropractor 12 or more times

Naturopath: A total of 61 or 5% of respondents stated they had visited a naturopath in the previous year. Two thirds indicated that they used the naturopath once or twice.

Massage Therapy: 60 (5%) participants reported having a health-related massage or using massage therapy in the past 12 months.

Myotherapy: 49 respondents indicated they had used myotherapy in the past year.

Access to Services

Most respondents (93%) reported having access to a car daily while 7% indicated they do not have access to a car for their use. These proportions were the same as the 2001-2003 study. Most respondents, 92%, also indicated that they would have someone to take care of them at home now and then if needed while 8% indicated they did not. Again, proportions were similar in the earlier study, 91% and 9% respectively. Finally, 85% reported in the current study that they would have someone to take care of them for a short period if they were sick or disabled for a few weeks or months, while 15% indicated they did not have this support. In the 2001-2003 study, 88% reported they would have someone to take care of them while 12% indicated they did not.

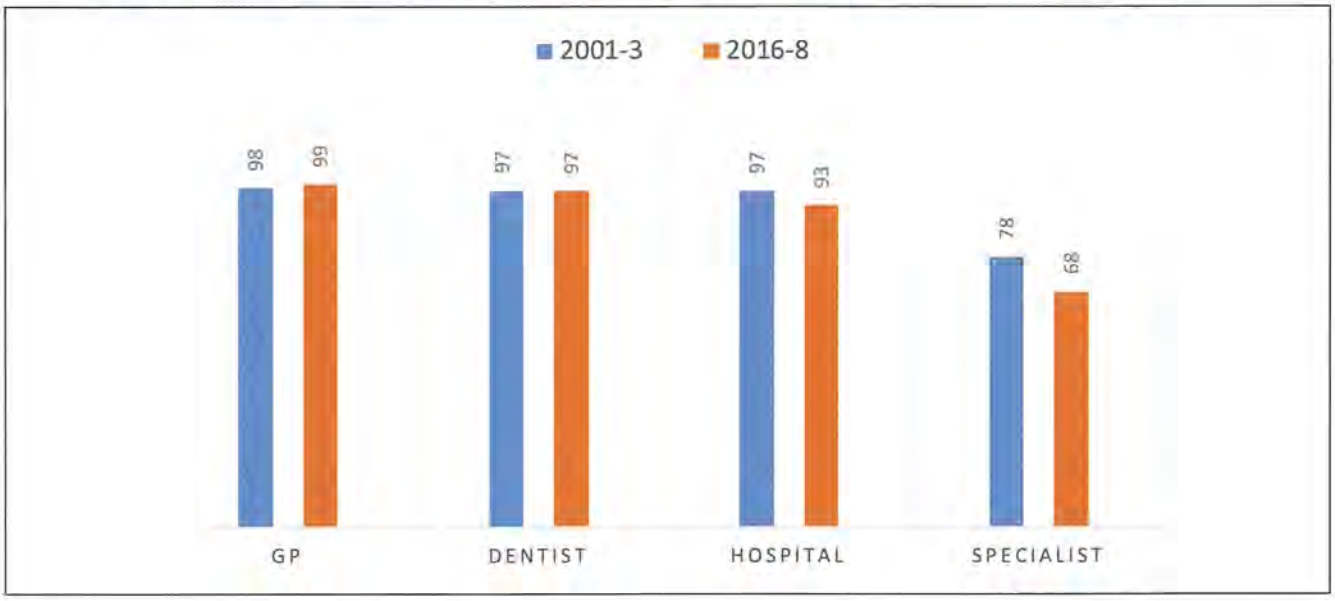
Respondents were asked how far they travelled to the GP, Dentist, hospital and medical specialist (see Table 19). Most reported using these services locally while almost a quarter travelled over 100km for a medical specialist. Respondents reported travelling this distance because the specialist was not available locally or it was their preferred provider. Within Shepparton and Mooroopna, respondents said they travelled to different areas of these towns to see their preferred GP rather than using the closest GP practice.

Table 19: Distance respondents report travelling to health services, in percent

Health Service	**Distance to health service**				
	<5km	**5-10km**	**11-50km**	**50-100km**	**>100km**
GP	76	20	3	0.5	0.5
Dentist	74	20	3	1	2
Hospital	66	26	1	1	6
Specialist	51	16	1	8	24

Compared to the earlier study, similar proportions are seeking GP and dentist services locally while a higher proportion are travelling further than 50km to access medical specialists (see Figure 7). This is related to the increased use of medical specialists reported earlier.

Figure 7: Percent of respondents travelling less than 50km to key services in 2001-03 and 2016-18



Respondents were also asked in an open ended question to identify concerns about access to health services in the local region. Two-thirds (66%) articulated that they had no concerns which is more than 49% indicating they had no concerns in 2001-2003. The major concerns were:

- cost (81 respondents)
- waiting times (44 respondents)
- travel (21 respondents)
- lack of specialists (20 respondents)
- access to services generally (20 respondents)
- wait for referral; too long between diagnosis and appointment with specialist (16 respondents)
- prefer non-local care (14 respondents)

Currently, cost was the most frequently mentioned issue. One respondent indicated: *"Sometimes the cost [for] certain health services. An MRI for example. Unless I get a referral from my specialist for the MRI cost will be out of my pocket."* When asked to identify concerns about health services in general, access issues were raised again.

In the 2001-2003 study, the key access issues were found to relate to lack of staff, waiting times, quality of care and access to after-hours care. This suggests that concerns about access to health care among Shepparton and Mooroopna residents have changed.

Children

Adults in the household were asked about their children aged under 16 years of age. 1,133 children were reported on in 2001-2003 and 385 were answered for in 2016-2018 (see Table 20). Parents and guardians reported a higher prevalence of skin conditions, asthma and disability in 2016-2018 than in the earlier study. The proportion of children with asthma, allergies and diabetes were above Victorian rates.

Table 20: Children's health conditions reported

	Crossroads-I 2001-2003	Crossroads-II 2016-2018	Victorian comparison (%)
Number of children	1133	385	
Males	50%	55%	
Average Age (years)	7.9 (range 0-17)	7.4 (range 0-16)	
Asthma	22%	37%*	21% (ACAM 2009)
Skin conditions	11%	32%	NA
Allergies	11%	27%*	Food allergies 11% (ABS, 2013b)
ADHD	13%	6%*	5% (RCH 2018)
Disability	3%	11%*	7% (ABS, 2016)

** refers to % of families rather than % of children*

When asked about service use, most children, 91%, were reported to have seen a GP in the past year. Further, a higher proportion of children were found to have seen a specialist in the past year than in the earlier study (see Table 21). A higher proportion of children were reported to have seen a psychologist and speech therapist in the past year than in the 2001-2003 study.

Table 21: Reported use of services for children's health care, in percent

Use of services for children's health	Crossroads I 2001-2003	Crossroads II 2016-2018
GP (seen in past 12 months)	67	91*
Specialist (seen in past 12 months)	3	40*
Location of Specialist		
Shepparton	50	60
Northern-Epping	47	0
Melbourne (other)		33
Psychologist (seen in past 12 months)	2	13*
Speech therapist (seen in past 12 months)	3	16*

** refers to % of families with children rather than % of children*

Parents were also asked about their children's health behaviours (Table 22). While rates of immunisation were reported to be similar in Crossroads I and II, eating takeaway food and eating less than the recommended vegetable intake were reported to increase over the 15 years.

Table 22: Children's health behaviours as reported by parent/guardian

	Crossroads-I 2001-2003	Crossroads-II 2016-2018	Victorian comparison
Immunisation	97%	98%*	95% of 5 years old (Australian Government Department of Health, 2019)
Soft drink/sugar sweetened beverage consumption yesterday	NA	42%*	47% (ABS 2015)
Insufficient vegetable serves per day	81% (less than 4 serves)	92% less than 5 serves, 88% less than 4 serves*	95% (ABS 2015)
Insufficient fruit serves per day (less than 2 serves)	29%	25%*	32% (ABS 2015)
Takeaway food as a main meal (at least one meal per week)	36%	55%*	69% at least once per week (Timperio et al, 2009)

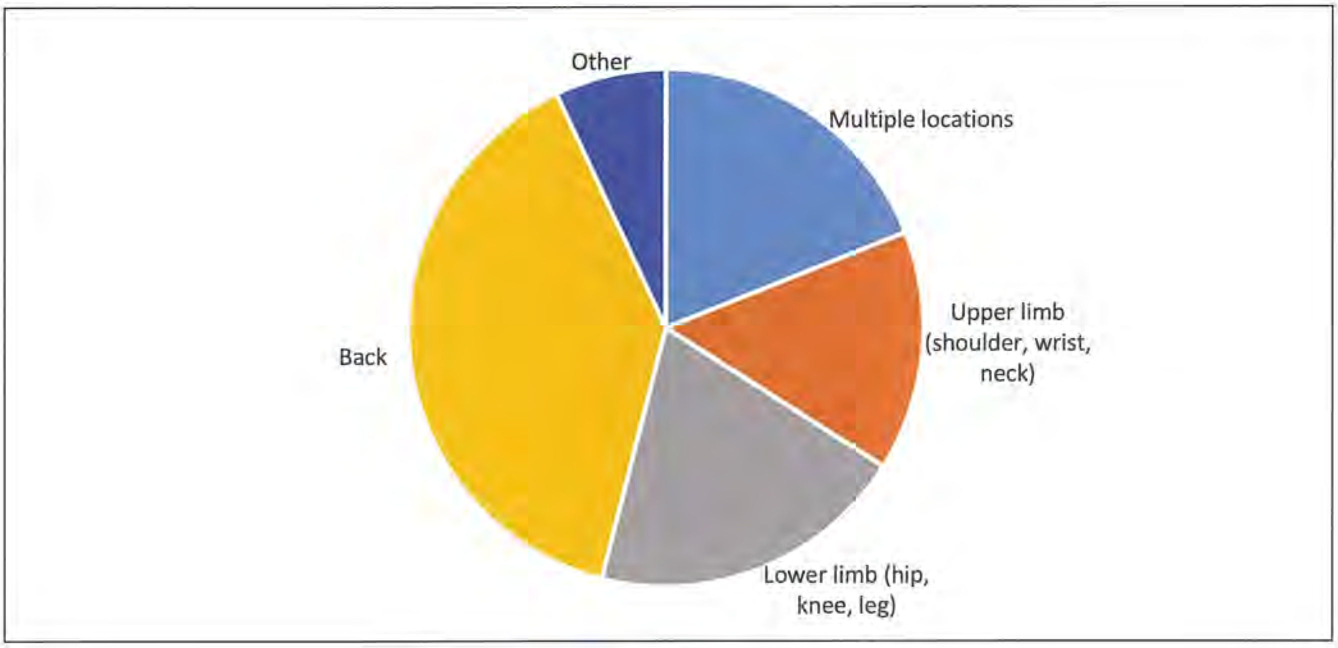
**of families with children rather than percent of children*

Chronic Pain

22% reported chronic pain

A total of 295 respondents, or 22%, reported experiencing chronic pain. Back pain was the most common site of the pain (see Figure 8). The cause of the chronic pain was most commonly arthritis (for 30%) as well as musculoskeletal (16%), injury (13%), inflammatory (8%), nerve (7%), undiagnosed (4%) and other causes, including cancer, abdominal and surgical (22%). Of those living with chronic pain, 80% reported another health condition and almost one-quarter identified depression. In addition, three-quarters were overweight or obese. The average length of the chronic pain was identified as seven years although one-fifth said they had experienced chronic pain for more than 10 years. Of the 295, two-thirds were women and one-third indicated having private health insurance. Women and those not completing Year 12 were statistically more likely to experience chronic pain. Chronic pain was not asked about in the earlier study.

Figure 8: Locations of chronic pain



Just over half of the participants reporting chronic pain, 55%, indicated they use prescription medication and many said they were using more than four prescription medications daily. It was also found that 56% of those experiencing chronic pain identified using 'over the counter' medications, including panadol-osteo, paracetamol, codeine and NSAIDs.

Only 5% of those with chronic pain indicated they had used a pain clinic or specialist to assist in managing their pain. Others identified a range of techniques, including physiotherapy (31%), massage (20%), exercise such as hydrotherapy, yoga or tai chi (40%), dietary or herbal remedies (39%), acupuncture or chiropractor (23%) and smaller numbers used aromatherapy, hypnotherapy, osteopathy, relaxation and procedural interventions.

When respondents suffering chronic pain were asked how their condition could be improved, four key issues were identified:

- Pain clinic and/or pain specialists
- Clearer and better diagnosis
- Reduced waiting times to GPs, specialists, allied health and complementary medicine
- Education for GPs about chronic pain

Disability

A total of 243 respondents, 18% of all surveyed, indicated that they have a disability that restricts daily activities (see Table 23). Most reported a physical disability of some kind and 202 of the 243 indicated that they are 'restricted in everyday activities' because of their disability. Specifically, 44% of the 202 reported always being restricted, 24% said they were often restricted and 19% indicated they were sometimes restricted in their daily activities. Less, 13%, reported that they were rarely or never restricted in their daily activities by their disability condition.

18% have a disability

Table 23: Type of Disability reported by respondents

Types of Disability	Number of participants	% of those with disability	% of all participants
Self-reporting disability	**243**	**100**	**18.0**
Physical disability affecting feet and legs	130	54	9.7
Chronic or recurrent pain or discomfort	116	48	8.6
Physical disability affecting other part of body	92	38	6.9
Physical disability affecting arms and fingers	65	27	4.8
Nervous or emotional condition	37	15	2.8
Shortness of breath or difficulty breathing	35	14	2.6
Mental health condition	27	11	2.0
Total or partial loss of hearing	22	9	1.6
Total or partial loss of sight	16	7	1.2
Stroke	16	7	1.2
Blackouts, fits or loss of consciousness	13	5	1.0
Difficulty with or total loss of speech	8	3	0.6
Learning difficulties	6	3	0.4
Acquired brain injury	3	1	0.2
Intellectual disability	3	1	0.2
Brain damage	2	1	0.1
Multiple Sclerosis	2	1	0.1
Autism	2	1	0.1

When participants were asked about specific devices used to assist with their condition, the following respondents identified using these aids.

- 56 used a walking stick
- 52 wore glasses
- 39 had shower rails
- 37 used outdoor rails
- 36 used a shower chair or stool
- 33 used indoor handrails
- 29 used a wheelie walker
- 21 used hearing aids
- 17 had a toilet seat raiser
- 9 used a wheelchair, of which 4 used a manual wheelchair
- 8 had kitchen/dining aids
- 6 used a lift chair
- 4 used a commode

Fewer reported using crutches, heat packs, bed rail, toilet rail, a brace, a scooter, ramps, an assistance dog and special beds, shoes, pillows and other household items.

Just over two-thirds (68%) of the 243 people with disability reported utilising a service for their disability. These services ranged from specific disability services (used by 25 participants) to aged care, allied health services, mental health services, Aboriginal health services, carers, home help, assistance showering or dressing, meals-on-wheels, case managers, district nursing, hospital care and GPs. Most of these respondents, 74%, were satisfied with the service used for their disability while 8% were dissatisfied. Suggested improvements by these respondents included the following and some acknowledge their partners and family for providing the support that they need:

- Increased access to services, particularly medical specialists, and reduced travel to access specialist services
- Financial support
- Improved access to shops and public buildings
- Appropriate transport
- More choice of services
- Weight loss
- Less stress
- Less stigma and judgement

The demographic profile of these 243 respondents with disability was similar to the broader sample of respondents: 62% were female, ages ranged from 19 to 96 with a median of 66 years, and 40% held a health care card. Respondents with disability were less likely to have completed Year 12. Further, two-thirds (67%) were somewhat happy or happier and their rating of their own health was similar to the broader sample. Disability was not asked about in the earlier study so cannot be compared.

Heart Disease and Stroke

A total of 206 or 15% of Shepparton and Mooroopna respondents indicated they had a heart condition or had previously had a stroke. This is higher than the proportion in 2001-2003 where 7% reported experiencing a heart condition or stroke. In this study, a heart condition or stroke included the following types of conditions:

- 104 indicated they had an irregular heart beat (atrial fibrillation)
- 72 had experienced angina (chest pain)
- 38 reported heart valve disease
- 31 had myocardial infarction
- 29 had experienced a transient ischaemic attack (TIA)
- 23 had had a stroke
- 16 reported heart failure at some time
- 9 identified having an aortic aneurysm
- 8 reported inflammatory heart disease, including endocarditis, myocarditis and pericarditis
- 7 reported cerebral bleeds
- 4 had had rheumatic fever
- 34 reported another heart condition or stroke of some kind, including previous surgery, stents, heart murmurs, fluid on the lungs and undiagnosed conditions/incidents

Of these 206 respondents, 9 reported that their heart had stopped and they required resuscitation (CPR). Further, 15 reported that they currently have a pacemaker and one indicated that they have an implantable defibrillator. These 206 respondents were also asked about tests they had received in relation to their heart condition or stroke:

- 150 reported they had had an echocardiogram
- 144 said they had undergone an exercise tolerance (stress) test
- 139 recalled having their lipids/blood fats measured
- 127 had undergone testing with a 24hr heart monitor
- 100 reported a cardiac angiogram
- 46 indicated they had had a neck artery doppler
- 26 remembered a carotid angiogram
- 24 reported an aorta/lower limb angiography
- 16 indicated they had not had any of these tests

The 206 respondents who had experienced any form of heart disease or stroke were also asked about recommended lifestyle changes following their diagnosis. Of these:

- 55 said they were given advice about their diet
- 66 were recommended exercise
- 33 were advised to quit smoking
- 42 were advised to lose weight
- 25 indicated they were not advised of any of the above lifestyle changes
- 25 were given medication only

A few talked about being referred to a specialist, being monitored and other medical interventions after their diagnosis of their heart condition or stroke.

In the past 12 months, 141 or 68% said they had been to see a health professional about their heart or stroke, mostly a cardiologist or physician. In addition, 26 reported going to outpatients. While 9 respondents indicated that they had experienced a stroke or MI in the past year, 41, or 20% of those with heart disease or stroke, reported a related hospitalisation in the past 12 months.

Overall, 91% of those with heart disease or stroke were 'very satisfied' (59%) or 'satisfied' (32%) with their care while 3% were dissatisfied. The 206 respondents were also asked if they were concerned about their heart disease or stroke and a quarter (55 respondents) indicated that they were. Some suggested that better diagnosis, referrals, local angiograms and catheter laboratories, better specialists, more specialists, more education, better follow up and more prevention would improve care while many commented that their experience *"had been positive"* and local professionals *"do a wonderful job."*

When asked if their heart disease or stroke limits particular activities, physical activities and overall quality of life were reported to impact their life more frequently (see Table 24).

Table 24: Activities impacted by heart disease or stroke, in percent (n=206)

	Not at all	Limited a little	Limited a lot
Physical activities	63	23	14
Overall quality of life	76	14	10
Social activities	81	11	8
Personal care	90	8	2
Sexual activities	91	4	5

Myocardial Infarction (MI)

Of the 31 respondents indicating they had experienced a Myocardial Infarction (MI), most (24) responded that they had experienced one while 5 respondents said they experienced two, one described experiencing 3 and one respondent indicated they had had six MIs. Half of these MIs were reported to have occurred within the previous nine years while half the MIs were reported to occur at least 10 years ago. Half were treated locally for their MI while 10 were treated in Melbourne and others in other regions of Victoria, states or countries. Of the 31 experiencing an MI, 5 said they received thrombolytic therapy and 15 participated in formal rehabilitation afterwards. Further, 20 indicated they had a full recovery and eight indicated mild impairment.

Stroke

Of the 23 who reported experiencing a stroke, 19 identified having one stroke. Half reported experiencing the stroke within the past 7 ½ years while half reported their stroke was over 7½ years ago. Thirteen said they were treated locally while five talked about being treated in Melbourne and others said they lived elsewhere at the time of the stroke. Of the 23, three said they received thrombolytic therapy and 11 participated in formal rehabilitation after their stroke. When asked to rate their recovery, 10 reported a full recovery, five reported mild impairment, six reported moderate impairment and the remaining indicated severe impairment.

At the screening clinic of 343 randomly selected adults from Shepparton and Mooroopna, 33% of participants had cholesterol levels over the recommended 3.9—5.5mmol/L (Victor Chang Cardiac Research Unit, 2019). This is the same proportion as national findings by the Australian health survey 2011-2012 (33%) (ABS, 2013b) and a smaller proportion than in the 2001-2003 where 40% were found to have high cholesterol.

The percentage of males with systolic blood pressure 140mm/Hg+ or diastolic 90mm/Hg+ (36%) was similar to the percentage reported by the Australian Institute of Health and Welfare (2017b) of 35%. The percentage of females in this study with high blood pressure (25%) was lower than reported nationally (32%; see AIHW, 2017b). Five participants (1.5%) had previously undetected atrial fibrillation, one of the key risk factors for stroke.

Diabetes

Of the 1,344 participants, 114 or 8.5% reported they had been diagnosed with Diabetes. This is higher than the state average of 6% (DHHS, 2017) and an increase since 2001-2003 where 5% identified as having diabetes. Of these 114 individuals, eight identified as having Type 1 diabetes, 86 identified as having Type 2 diabetes, 14 reported they had Gestational diabetes, four were unsure which type of diabetes they had and others identified being borderline. Since the 2001-2003 study, there are is a greater proportion identifying as having Type 2 (56% in 2001-3 and 75% in 2016-8) than other types of diabetes.

8.5% reported diabetes

Among those indicating they have diabetes in the current study, treatments varied with 21 (18%) saying they treated with insulin, 78 (68%) with tablets, 92 (81%) by diet, 74 (65%) with exercise and 53 (46%) by weight loss. In 2001-2003, 22% said they were treated with insulin, 35% with tablets, 77% by diet, 55% with exercise and 34% by weight loss.

Respondents with diabetes ranged in age of when they were diagnosed from 3 to 77 years old. While 10% responded that they were diagnosed before turning 21 years of age, half said they were diagnosed under 50 and half when aged 50 years or older. In 2001-2003, 14% reported being diagnosed under 21, 53% under 50 years of age and 47% were diagnosed at age 50 or over.

In terms of testing blood sugar levels, 87 respondents said they monitor their blood sugar at home, 13 monitor indicated this was undertaken at a health clinic and 2 said they have a sensor while others said they do not monitor their blood sugar levels at all. When asked how many times per month their blood sugar levels are tested, responses ranged from 0 (23% of those with Diabetes), to weekly or less (25%), less than daily (17%) and at least once per day (35%). While this study identified that 48% of those with diabetes checked their blood sugar levels weekly or less, in 2001-2003, 26% checked their blood sugar levels weekly or less (16% did not check their blood sugar levels and 10% checked it weekly or less).

Most, 72% of those with diabetes, reported blood sugar levels between 4 and 10mmol/L most of the time. This is an increase from 60% in 2001-2003. 20 respondents indicated these tests were not done and four could not remember the results which is similar to the earlier study.

Respondents with diabetes also had other checks. Almost two-thirds reported having their feet checked in the past year which is higher than 41% as found in 2001-2003. Further, over a third (36%) were found not to have their feet checked in this study compared to 59% 15 years earlier. 79% reported having their eyes checked at least annually while 19% reported not having their eyes checked, and this is similar to findings 15 years earlier (78% and 22% respectively).

Of the 114 respondents with diabetes, 12 indicated that they had suffered hypoglycaemia, six of these in the past 12 months. A further three said they had experienced some blindness.

Respondents with diabetes talked about experiencing other conditions stemming from their diabetes, including:

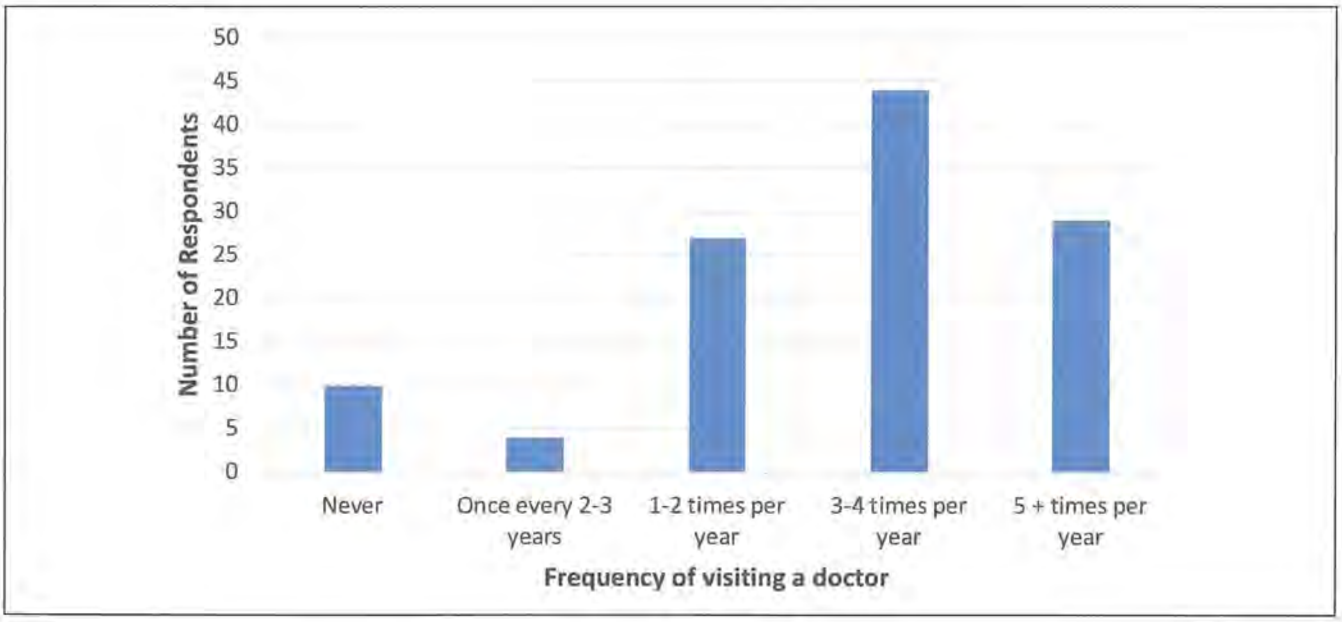
- 34 had been treated for cataracts (22 had had cataract surgery)
- 21 had had a doctor confirm poor circulation to the feet
- 19 had heart disease (11 had had heart surgery)
- 15 had nerve damage
- 9 said they had laser therapy to their eyes
- 6 had suffered kidney disease related to their diabetes
- 5 reported being treated for retinopathy
- 5 had experienced heart failure
- 5 had had a stroke
- 1 had had a foot ulcer

Of the 114 individuals with diabetes, 13 said they had been to a hospital outpatient clinics and two had been a hospital inpatient in the past year. This equates to 11% using hospital outpatient clinics and 2% had been inpatients which is lower than in 2001-2003 when 18% were found to attend hospital outpatients and 4% had been inpatients. Of those with diabetes, the following number of participants reported using these health professionals for their diabetes:

- 92 consulted a GP
- 33 used a diabetes educator
- 33 saw a podiatrist
- 18 saw a nurse
- 17 consulted an endocrinologist
- 14 saw a dietician
- 10 reported using both a GP and endocrinologist
- 4 said they did not use any health professional
- 1 used an exercise physiologist

In the 2001-2003, 57% reported consulting a GP (81% in 2016-2018), 10% seeing a dietician (12% in 2016-2018), 3% using an Endocrinologist (15% in 2016-2018) and 3% consulting an exercise physiologist (1% in 2016-2018). Respondents varied in how often they saw a doctor for their diabetes (see Figure 9), most stating they see a doctor 3-4 times each year.

Figure 9: How many times respondents with diabetes consulted a doctor



Of those with diabetes, 31% were concerned about their diabetes, which is less than in 2001-2003 when 47% reported being concerned. Currently, the concerns related most commonly to the condition being life threatening, impacting on key organs, long-term impacts and the challenge of managing diabetes daily. When asked if satisfied with their diabetes care, 89% were 'very satisfied' (56%) or 'satisfied' (33%). 3% of respondents with diabetes were 'dissatisfied' or 'very dissatisfied' with their care. Satisfaction rates are higher than in 2001-2003 when 85% reported being satisfied and 6% reported being dissatisfied. In the current study, improvements to care were identified in relation to better education, improved medical care and more services/support/education for children and young people.

In addition, 343 randomly selected adults attended a screening clinic where they were tested for diabetes. Oral glucose tolerance tests (OGTT) were undertaken by 308 participants. Among the participants with no known diabetes, 4 OGTT results (1%) indicated a new diagnosis of diabetes and 28 OGTT results indicated impaired glucose tolerance (9%). The rates of undiagnosed diabetes in 2001-2003 were 2% and a further 8% were found to have impaired glucose tolerance without previous diagnosis. Among the participants with no known diabetes in the current study, there were 7 (2%) glycated haemoglobin (HbA1c, a surrogate measure of blood glucose levels over previous months) results indicative of Diabetes.

Further, participants with known diabetes (37) typically did not take the OGTT (11 participants with diabetes took the OGTT and 26 did not take the OGTT). Of the participants with known diabetes, 27% had HbA1c levels over 48mmol/L indicating sub-optimal glucose control and 73% had levels below 48mmol/L indicative of good glucose control.

Respiratory Conditions

Respiratory issues were common among respondents (see Table 25), most frequently asthma, hay fever and bronchitis. A total of 262 or 20% of respondents indicated that they had been diagnosed with asthma or Chronic Obstructive Pulmonary Disease (COPD) by a doctor and 210 reported that they still had the condition. In 2001-2003, 5% indicated they had a respiratory condition. Most clinic participants (341 of the 343 clinic attendees) undertook a spirometry test to assess obstructive lung function at our screening clinic. Overall, 24% of participants showed some degree of lung dysfunction (FEV1/FVC <70%).

Table 25: Number participants reporting a respiratory condition, in percent

Condition reported	Number of Participants	Percent of respondents
Asthma	252	19
Hay fever	175	13
Bronchitis	115	9
Chronic Obstructive Pulmonary Disease	26	2
Emphysema	22	2

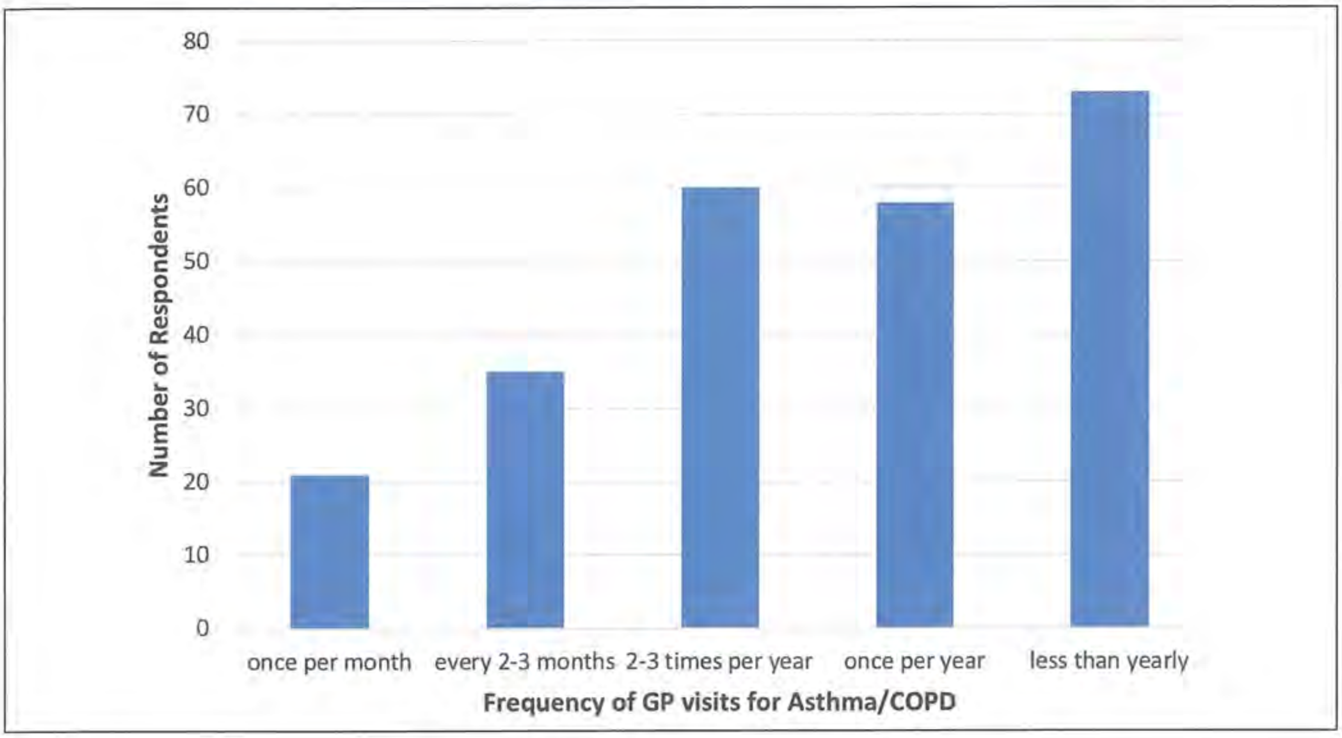
Of the survey respondents with asthma, 33 said they had had an asthma "attack" in the past three months due to exercise. Further, 135 identified that they wheeze during exercise and 129 reported that they wheeze at night. When asked if their asthma limited physical activities, half of the respondents indicated that it did not. One third said it limited them a little and 10% said it limited them a lot. One quarter indicated that their overall quality of life was limited by their asthma while fewer were limited in their social activities (12%) or personal care (8%).

Of those identifying that they had asthma/COPD, 82% reported that they did not have any sick days off work or school because of their asthma/COPD. Similarly, most of these respondents said they had not used the Emergency Department (ED) (92%) or been hospitalised (96%) in the past year because of their asthma/ COPD. Of those indicating they had used the ED, 13 had used it once, six had used it twice and three had used it three or more times. A total of 21 respondents reported that they had been admitted to intensive care at least once in their lifetime because of their asthma/COPD but for most respondents this was many years earlier.

A total of 68 respondents or 25% of those with asthma indicated that they had an action plan or written plan from a medical professional on how to manage their condition. Respondents varied in how often they saw their GP for their asthma or COPD (see Figure 10).

Most were not concerned about their asthma but 15% were concerned about their condition. These concerns mostly stemmed from asthma attacks being life threatening. When asked if they were satisfied with their care for their asthma/ COPD, 59% were 'very satisfied', 30% were 'satisfied' and 2% we re 'dissatisfied' or 'very dissatisfied'.

Figure 10: How often respondents with Asthma/COPD consulted their GP



When asked how care for asthma/COPD could be improved, responses related to:

- Environmental issues, such as pollens, trees and spraying
- Doctors providing more management plans
- More education about asthma
- Fewer smokers and less impact of second hand smoke
- Having more specialists or access to specialists locally

Hearing

Most clinic participants (342) undertook a hearing test. Some degree of hearing impairment was detected in 43% of participants. Among participants aged 51-60 years, 34% showed some degree of hearing impairment, higher than reported in an earlier national study (29%; see Access Economics (2006)). Among participants aged 61-70 years, 41% showed hearing impairment compared with 58% nationally (Access Economics, 2006). Participants aged 71 years or older commonly showed hearing impairment (87%).

Cognitive Impairment

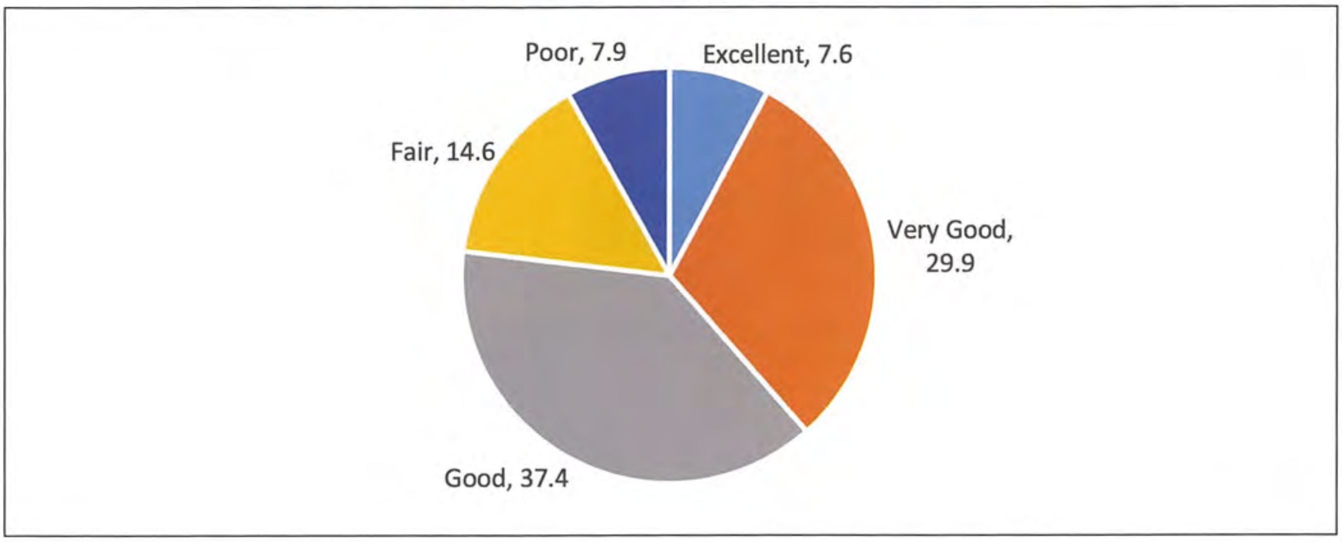
At the screening clinic, the Montreal Cognitive Assessment screening test was used to assess for mild cognitive impairment (see Zeltzer and Marvin, 2011). This test was undertaken by 340 participants (all ages). The average score was 26.7 (out of a possible 30), similar to a study of adults aged 55-90 years (average score of 26 (see Goldstein et al., 2018)). Among participants of all ages, 29% of scores were below 26, indicating some degree of cognitive impairment. Among people aged 65 and over, 46% of scores were below 26, higher than a similar study from Sweden (37% (see Borland et al., 2017)).

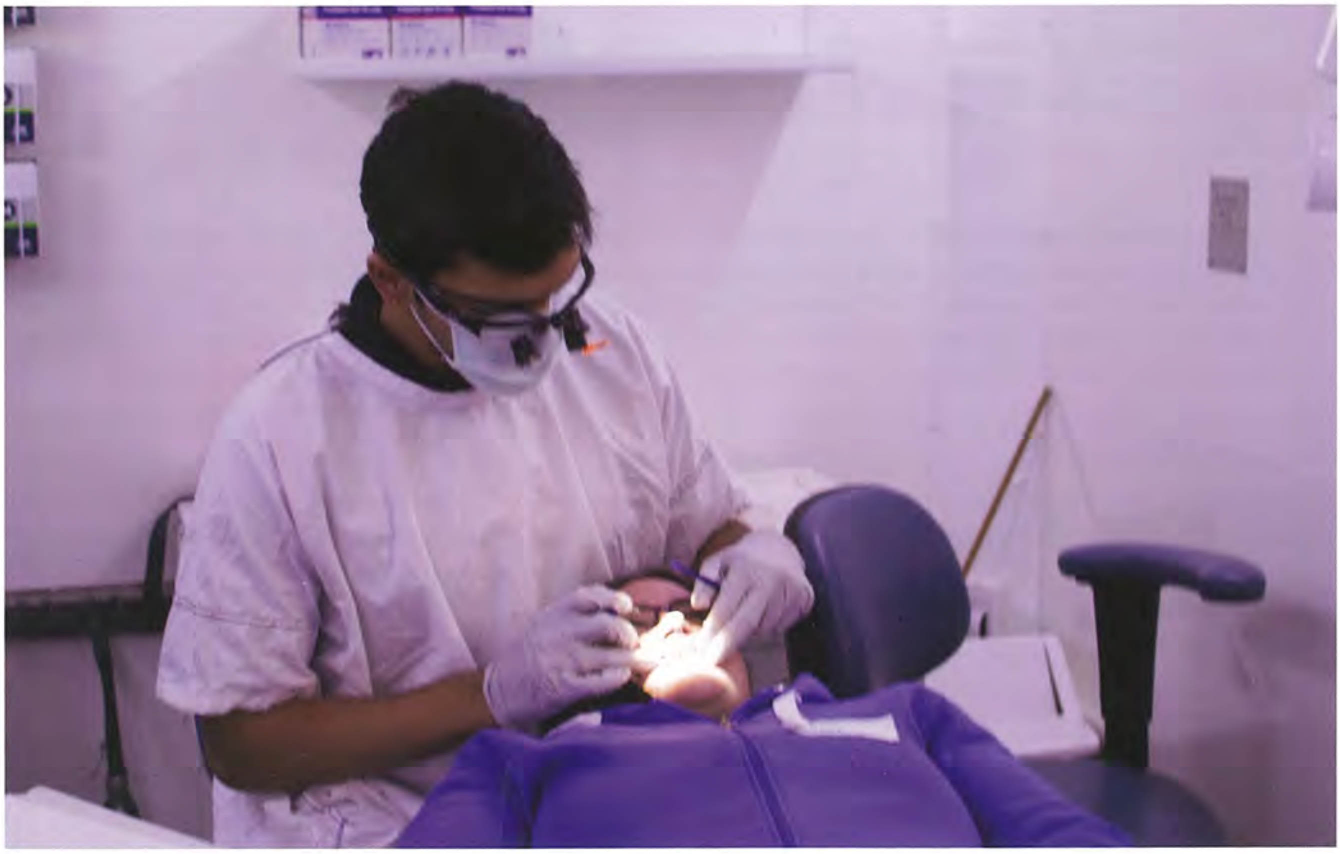
Dental Health

In the household survey, 71% of adults reported having their own teeth while 11% did not and 17% had some of their teeth. In 2001-2003, 67% reported having their own teeth, 16% did not have their own teeth and 17% had some of their own teeth. As indicated earlier, half had been to the dentist in the past year and 69% had visited the dentist in the past two years (see Table 17). Among those who did not visit a dentist, barriers to using a dentist were cited as: cost, dentures, fear, apathy and time.

At the clinic, participants were asked to rate the health of their teeth and gums. Most rated their teeth and gums as good or very good (see Figure 11).

Figure 11: Teeth and gum health reported by clinic participants





DISCUSSION

WHAT DO THESE FINDINGS MEAN OVERALL?

While an older sample and more female, this study has gathered detailed information about the health of residents of Shepparton and Mooroopna. In this large, randomly selected study sample, self-rated measures of health and happiness were high. Respondents were happy with their GPs and generally happy with most service providers but wanted more medical specialists locally and were concerned about the increasing costs of health care. Rates of smoking were lower than in Victoria generally (DHHS, 2017).

Key health issues identified in the study were high rates of chronic pain and disability, particularly physical disability, among local residents. There are local services in Shepparton to support chronic pain (at Primary Care Connect) and disability management (Shepparton Access, Connect GV and others). Given these high rates, it is important that community environments and infrastructure in Shepparton and Mooroopna enable people with restricted mobility to move around to ensure their social and economic participation as well as their own wellbeing.

Other key health conditions were obesity, heart disease and high blood pressure. Findings also suggest that respondents could improve their vegetable intake, activity levels and consume fewer takeaway meals to improve health outcomes. Access issues were also identified, primarily associated with cost, waiting times and quality of care.

The results of Crossroads II highlight what local services know are the key conditions and key issues in using health services. The results provide evidence of the observations of local health services and arm local services and consumers with information to address key issues. The key findings include:

- Residents of Shepparton and Mooroopna rate their own health higher than the state average and this was found in Crossroads I in 2001-2003.
- Study participants were happier than 15 years earlier.
- Levels of community participation were reported to be similar or slightly lower than 15 years earlier.
- Self-reported rates of smoking have declined and were below the state average; this suggests efforts to promote quit smoking in the region have been successful.
- Healthy eating could be improved. Like the consumption of alcohol, self-reported eating and drinking behaviours remained similar to 15 years earlier. Further, reported physical activity had increased and rates of obesity had also increased. There are significant efforts in Shepparton by Goulburn Valley Primary Care Partnerships, Primary Care Connect, Goulburn Valley Health and Greater Shepparton City Council to encourage healthy weights and improve eating patterns and physical activity among local residents, particularly children.
- The self-reported rates of chronic and long-term conditions were higher in this study than the previous study, including the proportion of respondents with eye problems, high blood pressure, arthritis, allergies, high blood fats, depression, hearing loss, skin conditions, digestive problems, respiratory problems, heart problems, cancer, thyroid trouble, osteoporosis, diabetes and circulatory problems. Multiple services, including Goulburn Valley Health, Primary Care Connect, Goulburn Valley Primary Care Partnerships and Greater Shepparton City Council, are working to promote healthy lifestyles and prevent chronic disease.
- Self-reported rates of depression had increased and levels of psychological distress were slightly higher than the state average. While use of mental health services has increased, these results suggests there is unmet demand for services. There are efforts by Goulburn Valley Health and other services to improve access to and the quality of mental health services.
- Service providers are aware of the high prevalence of chronic pain and Primary Care Connect and GVH have clinics and projects to assist in better pain management.
- There is a significant proportion of residents reporting a disability; Shepparton Access and other services are aware of the extent of disability and provide services appropriately.

- 93% of respondents said they had visited a GP in the past 12 months and more respondents said they were able to see a GP within three days than in the Crossroads I study 15 years earlier.
- Use of medical specialists was reported to have increased over the past 15 years; Goulburn Valley Health has increased access to a range of medical specialists and this study suggests these services are used and appreciated.
- Satisfaction with GPs and medical specialists increased from the previous study.
- There is a significant proportion of residents reporting a disability; Shepparton Access and other services are aware of the extent of disability and provide services appropriately. Community infrastructure and planning for people with physical disabilities will be important in the future to ensure they have access to services and can actively participate in community life.
- The self-reported rates of chronic and long-term conditions were higher in this study than the previous study, including the proportion of respondents with eye problems, high blood pressure, arthritis, allergies, high blood fats, depression, hearing loss, skin conditions, digestive problems, respiratory problems, heart problems, cancer, thyroid trouble, osteoporosis, diabetes and circulatory problems. Multiple services, including Goulburn Valley Health, Primary Care Connect, Goulburn Valley Primary Care Partnerships and Greater Shepparton City Council, are working to promote healthy lifestyles and prevent chronic disease.

This study has some limitations in that key groups of residents in Shepparton and Mooroopna are under-represented, including Aboriginal and Torres Strait Islander people, those not speaking English and younger people. Researchers worked hard to re-visit households and seek translation but sometimes language was a barrier. This report provides the overall frequencies and percentages and further analysis will be undertaken over time on specific health conditions, behaviours and issues.

A final note is made about loneliness, as identified during data collection. There is a large proportion of residents in Shepparton and Mooroopna living alone with few social contacts. Some are fearful to go out, some struggle with physical mobility and others lack information, access, inclusion, motivation and enthusiasm to venture far from their homes. Rather, they spend a lot of time alone and were keen to chat with researchers about their health, their families and their lives. While this was not investigated in this study, attempts to engage those who do not go out and engage with others frequently by addressing their fear, mobility, access and interests would seem to be a worthwhile community initiative.

Overall, this study suggests that health care, health prevention activities and healthy lifestyles could be improved. However, many rate themselves as healthy and happy and responded positively about local health services. Further, a range of local services are working on improving the health of the community, with a new Chronic Pain Clinic, healthy lifestyles programs in many health services and public health plans and programs working across the sector to prevent obesity, social isolation and chronic disease. Declines in rates of smoking suggest advances are being made.

Recommendations

Given the findings, this study proposes three recommendations:

1. **Local services are needed and should be continued.** Local services are well used and needed by the community. The decrease in undiagnosed disease in the past 15 years suggests these services are screening and diagnosing key health conditions. The number and type of health services available in Shepparton and Mooroopna has increased; further new services in areas of need have been developed, including pain services, cancer services and other medical specialists. Support, funding and continuation of these services are important to local residents.
2. **Promote healthy living.** The increase in chronic and long-term conditions that prevent quality of life and healthy ageing call for a whole-of-community approach to promoting healthy lifestyles (see Allender et al., 2015). Promotion of physical activity, healthy diets and moderation of alcohol consumption are key to our community's health and wellbeing, both now and in the future. Expanding and integrating current strategies as well as engaging all sectors of the community in healthy living would provide a holistic approach.
3. **Address factors limiting local residents' ability to manage their health well.** Known as *the social determinants of health* (WHO, 2019), addressing key issues in people's lives enables healthier living and improved access to health care for those who need it. This includes income, employment, education, housing, transport, social connection and social inclusion. Addressing these issues for residents with disability, chronic pain, mental ill-health and/or who are socially isolated as well as for residents who are marginalised due to low income, low English proficiency and other cultural barriers is important for overall health, wellbeing and inclusion. Like the previous recommendation, a whole-of-community approach is required that will (i) integrate current initiatives, (ii) develop improved environments for access, inclusion and participation, (iii) challenge exclusionary behaviours and language, and (iv) engage new sectors of the community so that Shepparton and Mooroopna can improve the quality of life and conditions of daily living for all local residents.

For more information about the Crossroads study please see: http://go.unimelb.edu.au/eo6r

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