

# Hospital Utilisation and Outcomes Amongst Victorian Residents Born in Refugee-source Countries

An analysis of hospital admissions between 1998/99 and 2003/04 from the Victorian Admitted Episodes Dataset

A collaborative project undertaken by:



Published by : The Refugee Health Research Centre (a La Trobe University / Victorian Foundation for Survivors of Torture partnership) and the Chronic Disease Surveillance and Epidemiology Section, Victorian Government Department of Human Services, Melbourne, Victoria.

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This report was produced by Dr Ignacio Correa-Velez with assistance from Dr Vijaya Sundararajan, Dr Kaye Brown, and Professor Sandra M. Gifford.

Acknowledgments The author would like to thank Dr Michael Ackland, Dr Zahid Ansari and the staff from the Chronic Disease Surveillance and Epidemiology Section, Victorian Government Department of Human Services.

Also published at: <http://www.health.vic.gov.au/healthstatus/publications.htm>  
<http://www.latrobe.edu.au/rhrc/publications.html>

# Table of contents

List of Acronyms .....	7
Executive summary .....	8
1. Introduction .....	12
1.1 Background.....	12
1.2 Relevance of the study .....	13
2. Methods and limitations.....	13
2.1 Hospital admission data .....	13
2.2 Refugee-source countries.....	14
2.3 Population data .....	14
2.4 Calculation of standardised admission rates .....	15
2.5 Assessing Refugee-source country-born / Australia-born differences.....	15
2.6 Calculation of confidence intervals.....	16
2.7 Trend analysis.....	16
2.7.1 Total hospital admissions.....	16
2.7.2 Admission type .....	16
2.7.3 Diagnosis related group (DRG) type .....	16
2.7.4 Separation mode.....	16
2.7.5 Length of stay.....	16
2.7.6 Ambulatory care sensitive conditions (ACSCs) .....	16
2.7.7 Admissions for specific diagnosis categories .....	17
2.7.8 Top ten Australian revised diagnosis related groups (AR-DRG) .....	17
3. Outcomes by refugee-source country .....	18
3.1 Afghanistan.....	18
3.1.1 Total hospital admissions.....	18
3.1.2 Admission type .....	19
3.1.3 Diagnosis related group (DRG) type .....	21
3.1.4 Separation mode.....	22
3.1.5 Length of stay.....	23
3.1.6 Ambulatory care sensitive conditions (ACSCs) admissions .....	24
3.1.7 Admissions for specific diagnosis categories .....	26
3.1.8 Top 10 Australian revised diagnosis related groups (AR-DRG) .....	27
3.1.9 Key findings – Afghanistan-born .....	28
3.2 Bosnia-Herzegovina.....	29
3.2.1 Total hospital admissions.....	29
3.2.2 Admission type .....	30
3.2.3 DRG type .....	32
3.2.4 Separation mode.....	33
3.2.5 Length of stay.....	34
3.2.6 ACSCs admissions .....	35
3.2.7 Admissions for specific diagnosis categories .....	37
3.2.8 Top ten AR-DRGs .....	38
3.2.9 Key findings – Bosnia-Herzegovina-born .....	39
3.3 Burma (Myanmar).....	40
3.3.1 Total hospital admissions.....	40
3.3.2 Admission type .....	41
3.3.3 DRG type .....	43
3.3.4 Separation mode.....	44
3.3.5 Length of stay.....	45
3.3.6 ACSCs admissions .....	46
3.3.7 Admissions for specific diagnosis categories .....	48
3.3.8 Top ten AR-DRGs .....	48
3.3.9 Key findings – Burma (Myanmar)-born .....	49

3.4 Cambodia .....	50
3.4.1 Total hospital admissions.....	50
3.4.2 Admission type .....	51
3.4.3 DRG type .....	53
3.4.4 Separation mode.....	54
3.4.5 Length of stay.....	55
3.4.6 ACSCs admissions .....	56
3.4.7 Admissions for specific diagnosis categories .....	58
3.4.8 Top 10 AR-DRGs .....	58
3.4.9 Key findings – Cambodia-born.....	59
3.5 Chile .....	60
3.5.1 Total hospital admissions.....	60
3.5.2 Admission type .....	61
3.5.3 DRG type .....	63
3.5.4 Separation mode.....	64
3.5.5 Length of stay.....	65
3.5.6 ACSCs admissions .....	66
3.5.7 Admissions for specific diagnosis categories .....	68
3.5.8 Top ten AR-DRGs .....	69
3.5.9 Key findings – Chile-born.....	70
3.6 Croatia .....	71
3.6.1 Total hospital admissions.....	71
3.6.2 Admission type .....	72
3.6.3 DRG type .....	74
3.6.4 Separation mode.....	75
3.6.5 Length of stay.....	76
3.6.6 ACSCs admissions .....	77
3.6.7 Admissions for specific diagnosis categories .....	79
3.6.8 Top ten AR-DRGs .....	80
3.6.9 Key findings – Croatia-born.....	81
3.7 El Salvador .....	82
3.7.1 Total hospital admissions.....	82
3.7.2 Admission type .....	83
3.7.3 DRG type .....	85
3.7.4 Separation mode.....	86
3.7.5 Length of stay.....	87
3.7.6 ACSCs admissions .....	88
3.7.7 Admissions for specific diagnosis categories .....	90
3.7.8 Top ten AR-DRGs .....	91
3.7.9 Key findings – El Salvador-born.....	92
3.8 Eritrea.....	93
3.8.1 Total hospital admissions.....	93
3.8.2 Admission type .....	94
3.8.3 DRG type .....	96
3.8.4 Separation mode.....	97
3.8.5 Length of stay.....	98
3.8.6 ACSCs admissions .....	99
3.8.7 Admissions for specific diagnosis categories .....	101
3.8.8 Top ten AR-DRGs .....	102
3.8.9 Key findings – Eritrea-born .....	103
3.9 Ethiopia.....	104
3.9.1 Total hospital admissions.....	104
3.9.2 Admission type .....	105
3.9.3 DRG type .....	107
3.9.4 Separation mode.....	108
3.9.5 Length of stay.....	109
3.9.6 ACSCs admissions .....	110

3.9.7 Admissions for specific diagnosis categories .....	112
3.9.8 Top ten AR-DRGs .....	113
3.9.9 Key findings – Ethiopia-born .....	114
3.10 Former Yugoslavia not further defined .....	115
3.10.1 Total hospital admissions .....	116
3.10.2 Admission type.....	117
3.10.3 DRG type.....	118
3.10.4 Separation mode .....	119
3.10.5 Length of stay .....	121
3.10.6 ACSCs admissions.....	121
3.10.7 Admissions for specific diagnosis categories.....	123
3.10.8 Top ten AR-DRGs.....	124
3.10.9 Key findings – Former Yugoslavia nfd-born .....	126
3.11 Iran .....	127
3.11.1 Total hospital admissions .....	127
3.11.2 Admission type.....	128
3.11.3 DRG type.....	130
3.11.4 Separation mode .....	131
3.11.5 Length of stay .....	132
3.11.6 ACSCs admissions.....	133
3.11.7 Admissions for specific diagnosis categories.....	135
3.11.8 Top 10 AR-DRGs.....	136
3.11.9 Key findings – Iran-born .....	137
3.12 Iraq .....	138
3.12.1 Total hospital admissions .....	139
3.12.2 Admission type.....	139
3.12.3 DRG type.....	141
3.12.4 Separation mode .....	142
3.12.5 Length of stay .....	143
3.12.6 ACSCs admissions.....	144
3.12.7 Admissions for specific diagnosis categories.....	146
3.12.8 Top ten AR-DRGs.....	147
3.12.9 Key findings – Iraq-born .....	148
3.13 Somalia .....	149
3.13.1 Total hospital admissions .....	149
3.13.2 Admission type.....	150
3.13.3 DRG type.....	152
3.13.4 Separation mode .....	153
3.13.5 Length of stay .....	154
3.13.6 ACSCs admissions.....	155
3.13.7 Admissions for specific diagnosis categories.....	157
3.13.8 Top ten AR-DRGs.....	158
3.13.9 Key findings – Somalia-born.....	159
3.14 Sudan .....	160
3.14.1 Total hospital admissions .....	161
3.14.2 Admission type.....	161
3.14.3 DRG type.....	163
3.14.4 Separation mode .....	164
3.14.5 Length of stay .....	165
3.14.6 ACSCs admissions.....	166
3.14.7 Admissions for specific diagnosis categories.....	168
3.14.8 Top ten AR-DRGs.....	169
3.14.9 Key findings – Sudan-born .....	170
3.15 Vietnam.....	171
3.15.1 Total hospital admissions .....	172
3.15.2 Admission type.....	172
3.15.3 DRG type.....	174

3.15.4 Separation mode .....	175
3.15.5 Length of stay .....	176
3.15.6 ACSCs admissions.....	177
3.15.7 Admissions for specific diagnosis categories.....	179
3.15.8 Top ten AR-DRGs.....	180
3.15.9 Key findings – Vietnam-born .....	181
4. Summary and conclusions .....	182
References .....	185
Appendix 1: Population pyramids by country of birth (2001) .....	187
Appendix 2: Trends of admission rates for the Australia-born population.....	189

## List of Acronyms

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ACSCs	– Ambulatory Care Sensitive Conditions
AR-DRG	– Australian Revised Diagnosis Related Groups
BIMPR	– Bureau of Immigration, Multicultural and Population Research
COPD	– Chronic Obstructive Pulmonary Disease
DIMIA	– Department of Immigration and Multicultural and Indigenous Affairs
DRG	– Diagnosis Related Groups
ENS	– Employer Nomination Scheme
ENT	– Ear, Nose and Throat infections
HIV	– Human Immunodeficiency Virus
ICD-10-AM	– International Statistical Classification of Diseases, Tenth Revision, Australian Modification
LSIA	– Longitudinal Survey of Immigrants to Australia
nfd	– not further defined
PTSD	– Post Traumatic Stress Disorder
UNHCR	– United Nations High Commission for Refugees
VAED	– Victorian Admitted Episodes Dataset
WHO	– World Health Organization

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# Executive summary

## Background

Although Australia receives a significant number of humanitarian arrivals every year, relatively little data is available about the health needs of recently arrived refugees in Australia. The few studies that have investigated health needs report poorer health status, higher rates of long-term physical and psychological conditions, and greater number of visits to health care providers among humanitarian arrivals compared with immigrants with other visa categories. Some of the health problems identified include psychological disorders (anxiety, depression and post traumatic stress disorder), nutritional deficiencies, infectious diseases (tuberculosis, HIV/AIDS, hepatitis B and intestinal parasites), poor dental health, poorly managed chronic conditions, under-immunisation and delayed growth in children, and physical sequelae of torture.

A significant gap in knowledge is the lack of population data on acute health care service utilisation amongst refugee communities. The present report addresses this research gap by examining Victorian hospital admissions from 1998-99 and 2003-04.

## Purpose

This report is one of the first to investigate acute health care service utilisation amongst a population from a refugee background in Australia. It compares hospital admissions and related outcomes between Victorian residents born in a number of refugee-source countries and those born in Australia. More specifically, the report identifies trends of hospitalisations, hospital admission and separation types, Diagnosis Related Groups (DRGs), Ambulatory Case Sensitive Conditions (ACSCs), and length of stay. Profiles of infectious/parasitic diseases and mental/behavioural conditions are also analysed. The study also identifies areas of service provision that may not be adequate in addressing the health needs of refugee communities and reducing the health inequalities in the Victorian community.

## Methods

The Victorian Admitted Episodes Dataset (VAED) was used to analyse hospital admissions between 1998-99 and 2003-04. The VAED contains morbidity data on all admitted patients from the Victorian public and private acute hospitals. Given the lack of data on immigration status, the report focuses on refugee-source countries, that is, those countries whose inhabitants have been forcibly displaced due to persecution, violence, armed conflict and war. Consequently, 15 countries with a history of immigration to Victoria under the refugee and humanitarian program over the last 35 years were analysed. These countries are Afghanistan, Bosnia-Herzegovina, Burma (Myanmar), Cambodia, Chile, Croatia, El Salvador, Eritrea, Ethiopia, Former Yugoslavia (not further defined), Iran, Iraq, Somalia, Sudan, and Vietnam.

Rates of admission were age standardised to the estimated Victorian population using the direct method. For each of the six time periods of interest the specific population of each of the refugee-source countries (denominator data) was estimated by adding the number of arrivals in Victoria from that country (by age category) to the number of individuals recorded at the previous census. Standardised admission *rates* and *rate ratios* are used to compare hospital admissions and outcomes between selected refugee-source countries and the Australian-born population.

## Key findings

### Interpreting the results

Standardised *rates* are used to measure the number of new events that occur per person per unit time. For instance, the total hospital admission rate for Australia-born in 1998-99 was 358.52/1000 persons/year. In other words, 358.52 hospital admissions were recorded in Victoria amongst every 1000 Australia-born persons in 1998-99.

**Rate ratios** are used to compare admission rates amongst Victorian residents born in refugee-source countries with the admission rates amongst Victorian residents born in Australia. Rate ratio is defined as:

$$\text{Rate ratio} = \frac{\text{Admission rate in refugee-source country-born}}{\text{Admission rate in Australia-born}}$$

A rate ratio greater than 1.0 indicates that admissions were higher amongst those born in the refugee-source country being analysed compared with the Australia-born persons.

Key findings are described in terms of trends of rates and rate ratios over time. In other words, even though the rates for both the refugee-source country-born and the Australia-born may have for instance increased over time, when compared to each other (using rate ratios), rates for the refugee-source country-born may have been lower than the Australia-born rates. Conservative parameters were applied when comparing rate ratios. For instance, when rate ratios confidence intervals of refugee-source country-born intersected those of the Australia-born population, rate ratios were defined as similar.

### **Total hospital admissions**

*Total* hospital admission rates increased over the six-year period for the Australia-born population and for 93% (14 of 15) of the refugee-source countries. When compared with the Australia-born, rate ratios of *total* admissions were lower amongst 67% (10 of 15) of the refugee-source countries.

### **Elective hospital admissions**

Rates of *elective* hospital admissions increased for the Australia-born and for 87% (13 of 15) of the refugee-source countries. *Elective* admission rate ratios were lower amongst 60% (9 of 15) of the refugee-source countries compared with the Australia-born population.

### **Emergency hospital admissions**

Rates of *emergency* admission increased over time for the Australia-born and for 87% (13 of 15) of the refugee-source countries. When compared with the Australia-born average, 40% (6 of 15) and 33% (5 of 15) of the refugee-source countries reported similar and lower *emergency* admission rate ratios respectively.

### **Obstetric hospital admissions**

Rates of *obstetric* admission increased for 60% (9 of 15) of the refugee-source countries. In contrast, the Australia-born and 20% (3 of 15) of the refugee-source countries showed a decreasing trend over time. *Obstetric* admission rate ratios were higher amongst 60% (9 of 15) of the refugee-source countries compared with the Australia-born population.

### **Medical Diagnosis Related Groups (DRG) admissions**

*Medical DRG* admission rates increased over time for the Australia-born and for 93% (14 of 15) of the refugee-source countries. When compared with the Australia-born average, *medical DRG* admission rate ratios were lower amongst 53% (8 of 15) of the refugee-source countries. Four (27%) refugee-source countries recorded higher *medical DRG* admission rate ratios.

### **Surgical Diagnosis Related Groups (DRG) admissions**

*Surgical DRG* admission rates increased over the six-year period for the Australia-born and for 80% (12 of 15) of the refugee-source countries. Lower *surgical DRG* admission rate ratios were recorded amongst 73% (11 of 15) of the refugee-source countries when compared with the Australia-born population.

### **Separation to private residence/accommodation**

When compared with the Australia-born, lower rate ratios of *separation to private residence/accommodation* were recorded amongst 60% (9 of 15) of the refugee-source countries.

### **Discharge at own risk**

Rates of *discharge at own risk* increased over time for the Australia-born and for 67% of the refugee-source countries. Compared with the Australia-born average, 87% (13 of 15) of the refugee-source countries reported similar rate ratios of *discharge at own risk*.

### **Hospital deaths**

Rates of *hospital death* showed an increasing trend over time for the Australia-born and for 93% (14 of 15) of the refugee-source countries. *Hospital death* rate ratios were similar to the Australia-born average amongst 80% (12 of 15) of the refugee-source countries.

### **Length of stay in hospital (bed days)**

Rates of *length of stay* reported an increasing trend over the six-year period for the Australia-born and for 87% (13 of 15) of the refugee-source countries. Compared with the Australia-born average, 93% (14 of 15) of the refugee-source countries recorded lower *length of stay* rate ratios.

### **Total Ambulatory Case Sensitive Conditions (ACSCs) admissions**

*Total ACSCs* admission rates showed an increasing trend over time for the Australia-born and for 93% (14 of 15) of the refugee-source countries. Rate ratios were lower amongst 40% (6 of 15) of the refugee-source countries compared with the Australia-born population. Other six (40%) refugee-source countries recorded *total ACSCs* admission rate ratios similar to the Australia-born.

### **Acute Ambulatory Case Sensitive Conditions (ACSCs) admissions**

Rates of admission due to *acute ACSCs* increased over the six-year period for the Australia-born and for 93% (14 of 15) of the refugee-source countries. When compared with Australia-born averages, *acute ACSCs* admission rate ratios were lower amongst 53% (8 of 15), and similar amongst 33% (5 of 15) of the refugee-source countries.

### **Chronic Ambulatory Case Sensitive Conditions (ACSCs) admissions**

Rates of *chronic ACSCs* admission reported an increasing trend over time for the Australia-born and for all of the refugee-source countries. *Chronic ACSCs* admission rate ratios were similar amongst 53% (8 of 15) of the refugee-source countries compared with the Australia-born population. Three (20%) refugee-source countries recorded lower rate ratios, and other three (20%) reported either lower or similar rate ratios during the six-year period.

### **Vaccine-preventable Ambulatory Case Sensitive Conditions (ACSCs) admissions**

Rates of *vaccine-preventable ACSCs* admission decreased over the six-year period for the Australia-born and for 53% (8 of 15) of the refugee-source countries. Admission rates reported an increasing trend amongst 40% (6 of 15) of the refugee-source countries. When compared with the Australia-born, 60% (9 of 15) of the refugee-source countries recorded similar rate ratios, 13% (2 of 15) reported lower rate ratios, and only one (7%) refugee-source country showed a higher pattern of *vaccine-preventable ACSCs* admission rate ratios.

### **Infectious and parasitic diseases**

Rates of admission due to *infectious/parasitic diseases* recorded an increasing trend for 67% (10 of 15) of the refugee-source countries. Admission rates remained steady over the six-year period for the Australia-born and for 20% (3 of 15) of the refugee-source countries. Compared with Australia-born averages, *infectious/parasitic diseases* admission rate ratios were similar amongst 60% (9 of 15) of the refugee-source countries, lower amongst 13% (2 of 15), and either lower or similar amongst other two (13%) refugee-source countries. Two refugee-source countries (13%) reported higher admission rate ratios due to *infectious and parasitic diseases*.

### **Mental and behavioural disorders**

Rates of admission due to *mental and behavioural disorders* reported an increasing trend over time for the Australia-born and for 87% (13 of 15) of the refugee-source countries. Lower rate

ratios of admission due to these conditions were recorded amongst 93% (14 of 15) of the refugee-source countries when compared with the Australia-born population.

#### **Top ten Australian Revised Diagnosis Related Groups (AR-DRG) in 2003-04**

In 2003-04, renal dialysis was the top AR-DRG for the Australia-born and for 80% (12 of 15) of the refugee-source countries. Compared with the Australia-born, pregnancy and birth-related conditions, and digestive tract disorders (including diagnostic procedures), accounted for a higher proportion of hospital admissions amongst 73% (11 of 15) and 47% (7 of 15) of the refugee-source countries respectively.

#### **Trend over time**

When comparing rate ratios between individual refugee-source countries and Australia-born, a trend towards the Australia-born average over time was commonly observed, particularly amongst the European refugee-source countries.

# 1. Introduction

## 1.1 Background

In Australia, about 127,000 people have arrived under the Humanitarian Program over the last 10 years <sup>1</sup>. Thirty percent of these arrivals have settled in Victoria. The Humanitarian Program provides protection to refugees and other people of concern who have suffered gross human rights violations <sup>2</sup>.

Health problems amongst refugees may be the result of adverse pre-migration experiences, such as torture/trauma in country of origin and during flight, poor health status and lack of adequate health care in country of origin, or whilst in their country of asylum (e.g., economic hardship, unemployment and underemployment, social isolation, cultural and language barriers, changes in lifestyle, discrimination and racism). Although refugees are not a homogeneous group, the following health problems have been identified amongst recently arrived refugee communities in Australia <sup>3-6</sup>:

- Psychological disorders such as anxiety, depression and post traumatic stress disorder (PTSD);
- Nutritional deficiencies;
- Poor dental health as a result of poor nutrition and diet, lack of fluorinated water, poor oral hygiene practices, limited dental care, and in some cases torture to the oral cavity;
- Infectious diseases, including tuberculosis, HIV/AIDS, hepatitis B and intestinal parasites;
- Chronic diseases which have been poorly managed, such as high blood pressure, diabetes, and chronic pain;
- Under-immunisation and delayed growth/development in children;
- Physical consequences of torture such as musculoskeletal pain and deafness.

Relatively little data is available about the health needs of recently arrived refugees in Australia. The few studies that have investigated health needs report poorer health status, higher rates of long-term physical and psychological conditions, and greater number of visits to health care providers among humanitarian arrivals in Australia compared with immigrants with other visa categories <sup>7, 8</sup>. Results from the Longitudinal Survey of Immigrants to Australia (LSIA) carried out by the Australian Bureau of Immigration, Multicultural and Population Research (BIMPR) <sup>8</sup> showed that principal applicants in the Humanitarian Program were the least likely to rate their health as 'very good' (37%) compared with more than 60% of those in the Business/Employer Nomination Scheme (ENS), Concessional Family, and Independent categories. Nearly 5% of the principal humanitarian applicants reported that their health was 'poor' or 'very poor', compared with less than 1% among the other immigration categories. Long-term medical conditions were most prevalent among principal applicants in the Humanitarian category (14%), followed by those in the Preferential Family (7%), Concessional Family (3%), Business/ENS (2%) and Independent (1.4%) categories. In relation to health care use, the LSIA found that Humanitarian arrivals "were more likely to visit a health care provider within the first six months of arrival" <sup>8</sup> (p. 44), and had greater number of visits to this providers than immigrants in other visa categories. Greater use of health care providers among Humanitarian entrants soon after they arrive in Australia can be explained by the health undertakings these entrants are required to take on by the immigration authorities in order to undergo assessment and treatment of any long-term medical condition they may have <sup>8, 9</sup>.

Although the small body of research on the health of recently arrived refugees in Australia is growing, no population data exist in relation to acute health services utilisation and outcomes amongst these communities, and how they compare with the Australia-born population. This report examines Victorian hospital admissions from 1998-1999 to 2003-2004. It compares

acute health care service utilisation and outcomes between people born in a number of refugee-source countries and the Australia-born population.

Data on admitted patients are gathered when “an **admitted patient** (a patient who undergoes a hospital’s formal admission process) completes an episode of care and ‘separates’ from the hospital (...) by being discharged, dying, transferring to another hospital or changing type of care” <sup>10</sup> (p. 276). Hospital admissions reflect the amount of a disease condition a group experiences and the resources they can call upon to address their health problems. A person from a small, isolated or fragmented community may experience different treatment from someone with the same condition who belongs to a community that has supportive family networks and health care professionals who understand their language and culture. Hospitalisation may occur more promptly in the first scenario, but take longer or be avoided altogether in the second scenario <sup>11</sup>.

## 1.2 Relevance of the study

This report is one of the first to investigate acute health care utilisation and outcomes amongst Victorian residents born in refugee-source countries. The study addresses important research gaps in the area of refugee population health. It also identifies areas of service provision that may not be adequate in addressing the health needs of refugee communities and reducing the health inequalities in the Victorian community.

In particular, this study identifies trends in hospital admissions, admission types (i.e. elective, emergency, and obstetric), Diagnosis Related Group (DRG) types (i.e. medical or surgical), separation modes (i.e. private residence/accommodation, left against medical advice or death), and length of stay. The report also includes a trend analysis of admissions for Ambulatory Care Sensitive Conditions (ACSCs) and for two specific diagnosis categories: infectious and parasitic diseases, and mental and behavioural conditions. Infectious diseases and psychological disorders are common health problems among refugees <sup>12</sup>.

ACSCs are those conditions “for which hospitalisation is thought to be avoidable if preventive care and early disease management are applied, usually in the ambulatory setting” <sup>13</sup>. In theory, timely and effective ambulatory care can reduce the risks of hospitalisation by: preventing the onset of an illness or condition; or managing a chronic disease or condition <sup>13</sup>” <sup>14</sup> (p.6). ACSCs admission rates are a useful tool for the assessment of both access to health care and the adequacy of primary health care. Understanding access to health care as barriers to receiving care as well as the quality of the care provided <sup>14</sup> may help to determine “whether access-related problems can explain the relatively poorer health outcomes of specific population groups” <sup>14</sup>, including refugee populations.

## 2. Methods and limitations

### 2.1 Hospital admission data

Hospital admission data were obtained from the Victorian Admitted Episodes Dataset (VAED). The VAED contains morbidity data on all admitted patients from the Victorian public and private acute hospitals, including acute facilities in rehabilitation and extended care institutions and day procedure centres <sup>15</sup>. Although VAED is an administrative dataset that is collected for operational reasons, it provides useful information about acute health care use and health-related outcomes.

Clinical data are stored as ICD-10-AM<sup>a</sup> codes in 25 diagnosis and procedure fields (from 1998-1999 to 2002-2003) in the VAED <sup>16</sup>. The 2003-2004 VAED contains ICD-10-AM codes in 40 diagnosis and procedure fields. The ICD is a system of categories developed by the World Health Organization (WHO) to which disease conditions are assigned according to established criteria <sup>16</sup>.

## 2.2 Refugee-source countries

Two major shortcomings of the VAED dataset are the lack of data on immigration status (e.g. visa type upon arrival) and the lack of indicators on ethnicity beyond country of birth of the patient (with the exception of Indigenous Australians). While there are a number of ethical and logistic issues in relation to the collection of this type of information, this represents a significant constraint when trying to develop a population health profile of people from refugee backgrounds. Given these limitations, the current study uses country of birth as a proxy indicator of ethnicity, and focuses on refugee-source countries rather than on refugee populations per se. Refugee-source countries are defined as those countries whose inhabitants have been forcibly displaced due to persecution, violence, armed conflict and war <sup>17</sup>. Australia is one of 16 countries with a formal program of resettlement of refugees through the UNHCR <sup>18</sup>.

For the purpose of the present study, 15 countries with a history of immigration to Victoria under the refugee and humanitarian program over the last 35 years were selected <sup>19, 20</sup>. The list of these countries is shown in Table 1. While for some countries the majority of its arrivals in Australia entered under the humanitarian category (e.g. Afghanistan, Iraq, Sudan, Bosnia-Herzegovina), other countries such as Chile and Croatia have had a more varied combination of arrival categories. Nevertheless, the refugee stream has contributed significantly to the overall migration of these specific communities into Australia.

**Table 1: Refugee-Source Countries Included in the Analysis**

Refugee-Source Countries	
Afghanistan	Ethiopia
Bosnia-Herzegovina	Former Yugoslavia nfd <sup>1</sup>
Burma (Myanmar)	Iran
Cambodia	Iraq
Chile	Somalia
Croatia	Sudan
El Salvador	Vietnam
Eritrea	

<sup>1</sup> The lack of statistical rigour and the inconsistent classification of country of birth for the countries from former Yugoslavia in both the Australian Bureau of Statistics census and the DIMIA Settlement Database have resulted in a significant proportion of respondents identifying themselves in the category of 'Former Yugoslavia, not further defined'

## 2.3 Population data

Population figures by five-year age groups were estimated using two sources. First, the Victorian resident population figures by country of birth of individuals produced by the 1996 and 2001 Australian Census <sup>21, 22</sup>. Second, the immigration data to Victoria by country of birth produced by the Department of Immigration and Multicultural and Indigenous Affairs (DIMIA) <sup>20</sup>. Population pyramids of Victorian residents (2001) born in Australia and in refugee-source countries are shown in Appendix 1.

<sup>a</sup> International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian modification

## 2.4 Calculation of standardised admission rates

Admission rates were age-standardised (direct method) <sup>23</sup>. For each of the six time periods of interest (i.e. 1998-99, 1999-2000, 2000-01, 2001-02, 2002-03 and 2003-04) the specific population of each of the refugee-source countries was estimated by adding the number of arrivals in Victoria from that country (by age category) to the number of individuals recorded at the previous census. For instance, the population of Afghanistan-born living in Victoria in 1998-99 was 2,586, that is, 1,874 (1996 Census) plus 712 (number of arrivals in Victoria between 1 July 1996 and 30 June 1999). Similarly, the number of Afghanistan-born living in Victoria in 2003-04 was 4,061, that is, 3,217 (2001 Census) plus 844 (number of arrivals in Victoria between 1 July 2001 and 30 June 2004). For some countries, the population decreased slightly at the 2001 Census compared with the estimated figures at the previous period of 1999-2000. The calculation of refugee-source countries' population at each time period did not take into account factors such as interstate and overseas migration and mortality figures.

For the Australia-born population, the 1996 Census figures by age category were used for the 1998-99 and 1999-2000 periods whereas the 2001 Census data were used from the 2000-01 period onwards. The estimated resident population of Victoria by age category for each of the six time periods of interest was used as the standard population <sup>24</sup>.

The Victorian female population aged 10 to 54 years by country of birth was used to calculate standardised rates for obstetric admissions.

## 2.5 Assessing Refugee-source country-born / Australia-born differences

Standardised admission **rates** and **rate ratios** are used throughout the report to compare hospital admissions and outcomes between selected refugee-source countries and the Australia-born population. Standardised **rates** are used to measure the number of new events that occur per person per unit time <sup>23</sup>. For instance, the total hospital admission rate for Australia-born in 1998-99 was 358.52/1000 persons/year. In other words, 358.52 hospital admissions were recorded in Victoria among every 1000 Australia-born persons in 1998-99.

**Rate ratios** are used to compare admission rates of Victorian residents born in refugee-source countries with the admission rates of Victorian residents born in Australia. Rate ratio is defined as:

$$\text{Rate ratio} = \frac{\text{Admission rate in refugee-source country-born}}{\text{Admission rate in Australia-born}}$$

A rate ratio greater than 1.0 indicates that admissions were higher for refugee-source country-born than for Australia-born persons.

Findings are described in terms of trends of rates and rate ratios over time. In other words, even though the admission rates for both the refugee-source country-born and the Australia-born may have for instance increased over time, when compared to each other (using rate ratios), admission rates for the refugee-source country-born may have been either lower, similar or higher than the Australia-born rates. Conservative parameters were applied when comparing rate ratios. For instance, when rate ratios confidence intervals of refugee-source country-born intersected those of the Australia-born population, rate ratios were defined as similar.

A random sample of 100,000 Australia-born admissions was taken for each time period and compared with the total number of admissions from the selected refugee-source countries. Trends of admission rates for the Australia-born population are presented in Appendix 2.

## 2.6 Calculation of confidence intervals

Confidence levels of 95% are used to assess and report the precision of admission rates and rate ratios. Confidence intervals for age-adjusted rates were calculated with the method based on the gamma distribution <sup>25</sup>. This method has been recommended for Public Health assessments as valid confidence intervals are generated even when the number of cases is very small <sup>26</sup>.

## 2.7 Trend analysis

Data from 1 July 1998 to 30 June 2004 were used in this analysis. The following indicators were assessed for individual refugee-source countries and compared with the Australia-born average over time:

### 2.7.1 Total hospital admissions

A trend analysis of the rates and rate ratios of total number of hospital admissions in Victoria over the six-year period was undertaken for each refugee-source country.

### 2.7.2 Admission type

The type of admission relating to the episode of care included:

- Elective (or planned) admission,
- Emergency admission, and
- Obstetric admission (maternity/birth episode).

### 2.7.3 Diagnosis related group (DRG) type

DRG type is derived from the Victorian adjusted AR-DRG V4.2 (Australian Revised Diagnosis Related Groups Version 4.2). Two DRG types were included in this analysis:

- Medical DRG admissions, and
- Surgical DRG admissions.

### 2.7.4 Separation mode

Three types of hospital separation were included in the present analysis:

- Separation to private residence/accommodation,
- Left against medical advice (discharge at own risk), and
- Death.

### 2.7.5 Length of stay

Trend analysis of length of stay was also included. The length of stay is calculated summing the total bed days of the patient relating to the episode of care.

### 2.7.6 Ambulatory care sensitive conditions (ACSCs)

The classification of ACSCs used in the Victorian Ambulatory Care Sensitive Conditions Study <sup>14</sup>, which draws from the objectives of primary health care, is used here. According to this classification, there are three categories of ACSCs:

- Acute ACSCs (reducing morbidity and pain through timely and appropriate treatment): This category includes acute disease for which hospitalisation is avoidable, for example,

dehydration/gastroenteritis, kidney infection, perforated ulcer, cellulitis, pelvic inflammatory disease, ear, nose and throat infections (ENT) and dental conditions. In this category, the conditions may not be preventable but theoretically do not result in hospitalisation if adequate and timely primary care is received.

- Chronic ACSCs (reducing the effect of chronic disease and prolonging life): This category includes selected chronic diseases for which hospitalisation is avoidable, for example, diabetes, asthma, angina, hypertension, congestive heart failure, chronic obstructive pulmonary disease (COPD). In this category, the conditions may be preventable through behaviour modification and lifestyle change, but they can also be managed effectively through primary care to prevent deterioration and hospitalisation.
- Vaccine-preventable ACSCs (reducing the incidence of preventable diseases): This includes hospitalisation for influenza, bacterial pneumonia, tetanus, measles, mumps, rubella, pertussis and polio-conditions for which vaccination is available. In this category, the actual conditions are deemed to be preventable, rather than the hospitalisation. There is, however, a misclassification bias with respect to vaccine-preventable ACSCs in the context of this study. Admissions due to vaccine-preventable ACSCs cannot be assessed among children born in Australia to refugee families because they are classified as Australia-born.

### **2.7.7 Admissions for specific diagnosis categories**

For the purpose of the present report, trend analyses of two specific diagnosis categories were included. These are:

- Infectious and parasitic diseases, which include the following ICD-10-AM blocks and codes <sup>16</sup>: Intestinal infectious diseases (A00-A09), tuberculosis (A15-A19), certain zoonotic bacterial diseases (A20-A28), other bacterial diseases (A30-A49), infections with a predominantly sexual mode of transmission (A50-A64), other spirochaetal diseases (A65-A69), other diseases caused by Chlamydiae (A70-A74), rickettsioses (A75-A79), viral infections of the central nervous system (A80-A89), arthropod-borne viral fevers and viral haemorrhagic fevers (A90-A99), viral infections characterised by skin and mucous membrane lesions (B00-B09), viral hepatitis (B15-B19), human immunodeficiency virus (HIV) disease (B20-B24), other viral diseases (B25-B34), mycoses (B35-B49), protozoal diseases (B50-B64), helminthiases (B65-B83), pediculosis, acariasis and other infestations (B85-B89), sequelae of infectious and parasitic diseases (B90-B94), bacterial, viral and other infectious agents (B95-B97), and other infectious diseases (B99).
- Mental and behavioural disorders, which comprise <sup>16</sup>: Organic, including symptomatic, mental disorders (F00-F09), mental and behavioural disorders due to psychoactive substance use (F10-F19), schizophrenia, schizotypal and delusional disorders (F20-F29), mood (affective) disorders (F30-F39), neurotic, stress-related and somatoform disorders (F40-F48), behavioural syndromes associated with physiological disturbances and physical factors (F50-F59), disorders of adult personality and behaviour (F60-F69), mental retardation (F70-F79), disorders of psychological development (F80-F89), behavioural and emotional disorders with onset usually occurring in childhood and adolescence (F90-F98), and unspecified mental disorders (F99).

These two diagnosis categories were included in order to assess the validity of the 'sick refugee' paradigm in the context of hospital use. The 'sick refugee' paradigm has commonly influenced the conduct of refugee health research worldwide <sup>11</sup>.

### **2.7.8 Top ten Australian revised diagnosis related groups (AR-DRG)**

A comparison of the top ten Australian Revised Diagnosis Related Groups (AR-DRG) between individual refugee-source countries and the Australia-born population for the period 2003-04 is also presented.