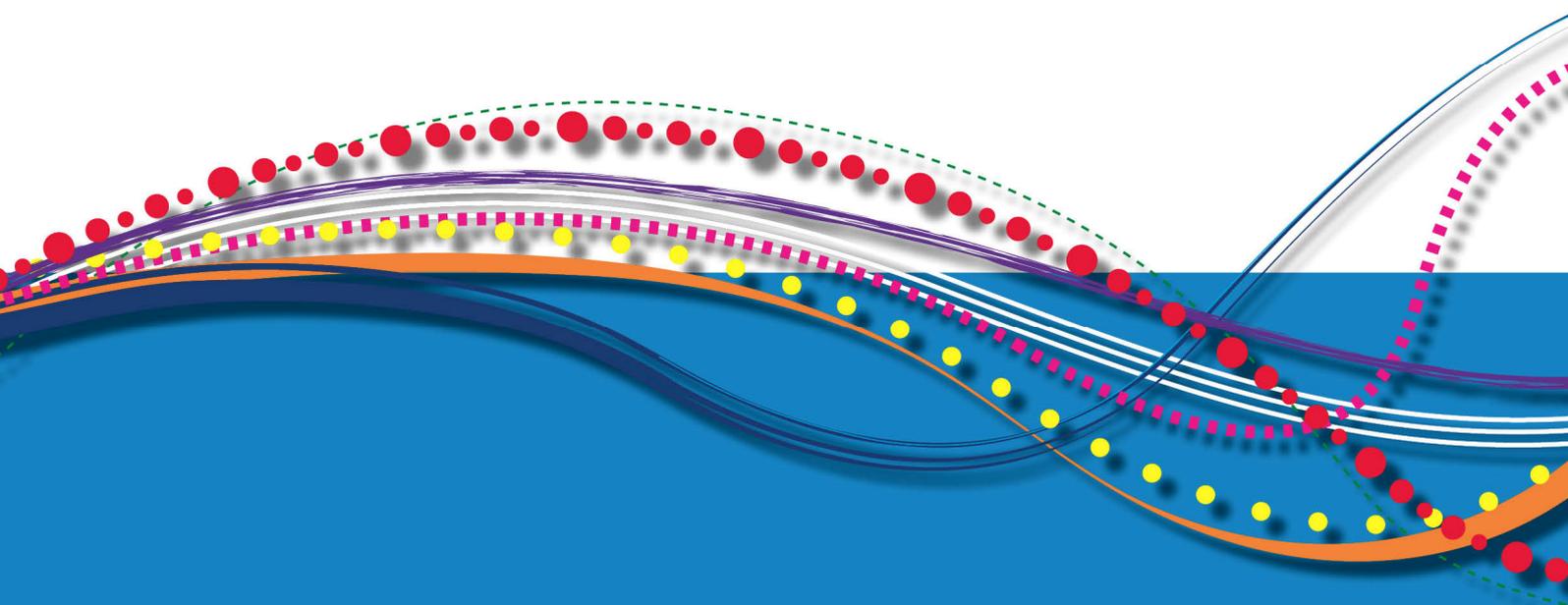


The health of Queensland's India-born population 2010



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For copyright information contact:

The IP Officer
Purchasing and Logistics Unit
Queensland Health
GPO Box 48
Brisbane QLD 4001
ip_officer@health.qld.gov.au

For further information contact:

Queensland Health Multicultural Services
Division of the Chief Health Officer
Queensland Health
GPO Box 2368
Fortitude Valley BC QLD 4006

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Summary

The health of the Queensland population has been extensively described in recent Queensland Chief Health Officer reports: *The Health of Queenslanders 2006 (1)*, *The Health of Queenslanders 2008: Prevention of Chronic Disease (2)* and *The Health of Queenslanders 2010 (3)*.

According to the 2006 Census, there were 10 955 India-born residents in Queensland. In the period 2001–2006, population growth of Queensland's India-born residents was markedly higher than that of Australia-born residents, 52 per cent and seven per cent respectively.

The India-born population of Queensland was found to have lower standardised hospitalisation ratios rates for:

- all causes
- avoidable conditions
- chronic obstructive pulmonary disease
- all cancers
- external causes
- musculoskeletal conditions.

Hospitalisations that were similar to the Australia-born population were for:

- coronary heart disease
- stroke
- diabetes
- diabetes complications
- diabetes excluding renal dialysis .

Numbers were small for India-born participants in the 2007 National Drug Strategy Household Survey, and risk factor data is therefore inconclusive.

Taking these findings together, the Indian community is a relatively healthy community. This likely reflects the fact that the India-born population is a significantly younger and newer community. This is consistent with the 'healthy migrant effect' which is generally maintained in the first five to ten years of migration (4-8).

National and international evidence indicates high mortality and hospitalisations from diabetes and cardiovascular disease in established Indian migrant populations. The focus in Queensland, therefore, needs to be on prevention of chronic disease as the health of this community worsens over time as acculturation takes place and the 'healthy migrant effect' dissipates. The findings also indicate a need for better data collection and analysis, and the need for population health surveys that specifically target culturally and linguistically diverse populations

About the document

Queensland has a culturally diverse population and this trend is increasing. Thirty-three per cent of Queenslanders were born overseas, or have a parent who was born overseas. More than 270 languages are spoken in Queensland and almost eight per cent of Queenslanders speak a language other than English at home. Almost 50 000 people, or 1.2 per cent of the population, are either unable to speak English well, or not at all. This equates to, on average, one in three people being born overseas, or having a parent born overseas; one in five people being from a culturally and linguistically diverse background; and one in 10 being from a non-English speaking background.

This document profiles the health of India-born Queenslanders, comparing their health status to that of all Queenslanders (the total Queensland population, including both Australian and overseas-born residents). It is one in a series of documents profiling the health status of Queensland's culturally and linguistically diverse communities.

Document structure

This document has seven sections:

Section one— *Literature review* presents a review of findings in national and international literature relating to the health of Indian populations.

Section two— *A profile of Queensland's India-born population* includes the age, sex and geographic distribution of the population.

Section three— *Health and Indian culture* focuses on the culturally- and spiritually-based health beliefs and systems that are widely practiced by many Indian Queenslanders.

Section four— *Wellness and illness – the health status of Queenslanders born in India* includes deaths (all causes and avoidable) and hospitalisations (all causes and avoidable).

Section five— *Determinants of Indian health and wellbeing* includes both risky and protective behaviours, as well as some of the cultural and social determinants of health.

Section six— *Hospitalisations* principally reports on the national health priority areas including cancer, cardiovascular disease, diabetes, respiratory disease and musculoskeletal disease.

Section seven— *Key implications for Queensland Health* outlines future directions for health service planning in Queensland in response to the findings.

1 Literature review

This literature review provides a synthesis of research in to the health of India-born people living in India, Australia and internationally. The literature dates from 1998 to 2011. A manual internet search was conducted using Google Scholar to identify per reviewed sources. A manual search was conducted of health websites including the World Health Organisation (WHO), the World Bank and the Australian Institute of Health and Welfare (AIHW). Search terms used included:

- India health status
- India migrant health
- India health indicators
- India-born migrant health
- India cardiovascular disease
- India diabetes
- India cancer.

1.1 International literature

Wellness and illness, the health status of Indian people

The World Health Organisation states that nearly one-eighth of equivalent life years continue to be lost due to various diseases in India (9). It reports that infectious diseases continue to be a burden while chronic diseases have shown an increase in terms of prevalence and mortality. While the report states that child mortality has shown a decline in recent years (9) it continues to be a problem, with India accounting for a quarter of the global child mortality (10). Maternal mortality is also the highest in the world, with 47 per cent of maternal deaths in rural India attributed to anaemia and haemorrhage (10). Non-communicable diseases have emerged as major public health problems in India, particularly (10):

- cardiovascular diseases
- diabetes mellitus
- cancer
- stroke
- chronic lung diseases.

Health outcomes in India

Chronic disease

Attention in developing countries is focused on communicable and infectious diseases. Cardiovascular diseases such as heart disease, stroke and diabetes are often assumed to be primarily a 'Western lifestyle disease'. However, a 2004 report documents increasing prevalence of cardiovascular disease in developing countries (11). The report, led by Australian epidemiologist, Professor Stephen Leeder, warns of rising chronic disease levels in less-developed and developing countries. In India (2005) chronic diseases contributed to an estimated 53 per cent of deaths and 44 per cent of disability-adjusted life-years lost (12). Cardiovascular diseases and diabetes are highly prevalent in urban areas (12). Cardiovascular diseases accounts for 28 per cent of the five million people that die each year in India, affecting those who are 65 years of age and under. WHO reports that cardiovascular and other chronic conditions are on the rise for the more disadvantaged Indian people, reporting that cardiovascular diseases 'have not only emerged in all but the very poorest countries, but are already well advanced' (13).

A range of factors such as the cumulative effects of childhood and foetal under-nutrition, higher smoking, alcohol and poor dietary habits in adulthood, are thought to be contributing to the escalating levels of chronic diseases such as stroke, cardiovascular disease and diabetes in India (14). India has the largest number of people with diabetes in the world, with an estimated 19.3 million in 1995 and projected 57.2 million in 2025 (15). Biological determinants of higher coronary disease are increasingly being detected in medical research (for example, high lipoproteins and lower glucose tolerance and insulin resistance) with some studies asserting that Indian people have the world's highest heart disease rates (16, 17).

Cancers

The Indian Council of Medical Research estimates that there are about 800 000 new cases of cancer in India each year. Reddy et al write that tobacco-related cancers account for a large proportion of all cancers, India accounting for the largest number of oral cancers in the world (12). They state the major cancers in men are mostly tobacco-related (lung, oral cavity, larynx, oesophagus, and pharynx), and for women, the leading cancer sites include those related to tobacco (oral cavity, oesophagus, and lung), and cervix, breast, and ovary cancer.

Communicable diseases

WHO gives the main causes of mortality in India as non-communicable diseases (48 per cent), communicable diseases (42 per cent) and injuries (10 per cent) (18). It reports the dominant communicable diseases as:

- infectious and parasitic diseases
- respiratory diseases
- maternal conditions
- peri natal conditions
- nutritional deficiencies.

The World Bank estimates 21 per cent of communicable diseases in India are water related (19). A report from the Public Health Foundation of India states that the two major infectious diseases in India are diarrhoea and malaria, accounting for 9.8 per cent and 10.8 per cent of hospitalisations respectively (20). According to the *World Health Organisation Country Cooperation Strategy, India 2006–2011*, the communicable disease burden remains significant with over 1.8 million new cases of tuberculosis and over one and a half million people contracting malaria each year (10).

Mental Health

Literature on the mental health of people in India is limited. WHO reports mental disorders as a common form of disability in India (10). A report from the Indian Government National Commission on Macroeconomics and Health recognises that conditions such as schizophrenia, mood disorders (bipolar, manic, depressive and persistent mood disorders) and mental retardation can impose a marked disease burden on Indian people (21). From the literature identified, it appears that mental health of Indian people is an area that has had little research in recent years.

Indian migrant populations

This burden of chronic disease, particularly diabetes and cardiovascular disease increasingly cuts across class and gender lines, rural and urban locations in India (22). However, studies consistently note a higher incidence rate as a result of urbanisation (the movement of people from rural to urban locations). Further, as a result of emigration, there has reportedly been a higher prevalence of diabetes and heart disease in Indian communities occurring in 'Westernised' countries (22, 23). This is particularly evident in countries with larger and longer-established Indian communities such as the United Kingdom, Netherlands, Fiji, United States and Canada. For example:

- In the United Kingdom, research demonstrates the prevalence of both heart disease and diabetes in Asian-Indian people (which also includes Sri Lankan, Bangladeshi, and Pakistani-born migrants) with these conditions reported as reaching epidemic levels (24). Abate and Chandalia report that Indian people who had migrated to the United Kingdom had a prevalence of diabetes that was about four times higher than that of those living in India (7). Large studies conducted at the United Kingdom Medical Research Council found early evidence of diabetes: British South Asian children (including Pakistani and Bangladeshi and Indian) were found to have higher average levels of insulin and insulin resistance than Caucasian children even after adjusting for height and ponderal index (25). The study concluded that the conditions leading to the higher mortality rates and risks of coronary heart disease found in South Asian adults in the United Kingdom were present in early childhood, requiring early interventions and attention to Indian children's health (25). A number of other United Kingdom studies indicate a similar pattern and rate of prevalence of cardiovascular disease in Indian (South Asian) migrant communities (25-27).

- In Canada, a large study of 1.2 million deaths recorded in the Canadian Mortality Database between 1979 and 1993 found that rates of death from ischemic heart disease were proportionately highest among Canadians of South Asian (India, Pakistan, Bangladeshi, and Sri Lankan) origin. The study also found that men and women of South Asian origin had a ‘substantially increased risk of death from diabetes compared with those of European origin’ (28). A later Canadian study involving 985 participants found that South Asians had the highest prevalence of cardiovascular disease compared to Europeans and Chinese participants (16). South Asian Canadians, both men and women, were also found to have increased prevalence of glucose intolerance, a precursor to diabetes, among other risk factors (16). Indian and South-Asian women were at increased risk of hospitalisation for heart disease compared to other European (Caucasian) migrant and Canadian-born populations with studies hypothesising that a lack of health literacy and recognition of the signs of heart attack are factors (29).
- In the Netherlands, there is evidence to suggest the risk of chronic disease continues over generations and that the risk is not limited to those born in India but affects the children and grandchildren of India-born migrants. A large scale study of 1790 Dutch persons of Indian ancestry found a high prevalence of ischaemic disease carrying over from third to seventh generation Indian-Dutch participants. The study found ischaemic heart disease risk profile to be evident in younger and apparently healthy participants (30).
- A US study in a New York City hospital found higher hospitalisation for heart disease, stroke, and diabetes mellitus in Indian people compared to other migrant and overseas-born populations (31). In addition, in their review of the impact of ethnicity on type 2 diabetes in the United States, Abate and Chandalia found that Indian-Asian migrants were among the major ethnic groups in the United States that appeared to have a ‘very high risk for type two diabetes which is accelerated by the adoption of the US lifestyle and the process of acculturation’ (7).
- A New Zealand study of the transition to motherhood in Indian migrant women residing in New Zealand found that a number of unprecedented stressors including both migration and new motherhood without the benefit of usual family and community supports exposed young Indian migrant women and their infants to poorer mental, social and physical health outcomes (32).

1.2 National literature

AIHW indicates overseas-born people are admitted to hospital at lower rates than the Australia-born population. In 2003–04 and 2005–06, the age-standardised total hospital separation rate for Australia-born patients was 20 per cent higher than for the overseas-born population (367 versus 300 per 1000 population) (33). Despite this general finding, AIHW reports that, in 2006 and 2008, people from India were hospitalised at significantly higher rates for a number of health conditions which include diabetes, heart attack, tuberculosis and dialysis; a higher standardised mortality rate for diabetes for people from India was also reported (4, 33). The most recent AIHW (2010) report states that death rates from diabetes continue to be higher for India-born Australians (34).

The Australian Bureau of Statistics (2006) confirms variances of causes of death across populations: diabetes is the third leading cause of death in India-born and ninth for the Australia-born population (35). National data also indicates the number of standardised prevalence ratios for self-reported diabetes was significantly higher than expected for men of South-East and Southern Asian origin than Australia-born men (36).

National data also indicates that jurisdictions with longer-established communities contribute to these national findings. For example, the *New South Wales 2002–2005 Report on Adult Health by Country of Birth* from the New South Wales Population Health Survey found that Indian people had the third highest proportion of persons with diabetes and high blood glucose, behind persons of Greek and Lebanese background, with a statistically significantly higher proportion of diabetes and high blood glucose in Indian men (14.8 per cent) compared to Australia-born men (7.1 per cent) (37). In the New South Wales 2008 Chief Health Officer report, India-born residents were found to have significantly higher rates of hospitalisations for diabetes or its complications than their Australia-born counterparts (38).

In addition, AIHW identifies ethnicity as a risk factor for gestational diabetes mellitus (GDM), with women from India, the Pacific Islands, Asia and the Middle East being at higher risk (39). A review undertaken of type 2 diabetes in CALD groups by New South Wales Department of Health cite a Sydney study in 2007 of 223 women which found Asian and Indian women to have a significantly higher rate of gestational diabetes mellitus (GDM) than Caucasian women (31.7 per cent and 36.4 per cent respectively compared to 14 per cent) (40, 41). Similarly, an earlier Sydney study reports that gestational diabetes is an indicator of type two diabetes in the future and that Indian women diagnosed with gestational diabetes are only three years from presenting with type two diabetes compared with 23 years in Anglo-Celtic women (42).

In Victoria, there were similar findings with the Melbourne Indian Health Study (MIHS) involving 297 men and 255 women of Indian ethnicity aged 25—78 reporting a statistically significant higher prevalence of type two diabetes, compared to Anglo-Celtic Melbourne population, and consistent with international literature of Indian migrant populations (43).

In summary, the literature indicates that:

- Diabetes, cardiovascular disease and/or their risk factors and precursors, are higher among India-born migrant populations elsewhere, evident both in India and in countries and Australian states that have longer-established Indian populations.
- Migration is an increased risk factor of these chronic conditions in Indian populations.
- Gestational diabetes mellitus is more prevalent in Indian women than the Australia-born population.
- Biological as well as social and lifestyle-related determinants of health are indicated in the literature as explanations for the increased prevalence of diabetes and higher associated hospitalisations and deaths among the Australian India-born population.
- The Australian Indian population has higher mortality for diabetes and hospitalisations for diabetes, heart attack, renal dialysis and tuberculosis compared to the Australia-born population.
- The New South Wales Indian population (a longer established community than Queensland's) has higher rates of diabetes and its complications and chronic disease related hospitalisations, compared to the Australia-born population.
- The Victorian Indian population has statistically higher self-reported prevalence of type 2 diabetes.

2 A profile of Queensland's India-born population

2.1 History of Indian migration to Queensland

India represents one of the fastest growing global economies and is one of the largest source countries for skilled labour in Australia and other developed nations. During the nineteenth century, Indian people were forced into indentured labour in British and Dutch colonies in places such as Fiji, Mauritius, Guyana, Trinidad, Surinam, Malaysia, South Africa, and Sri Lanka. Over two million Indian men fought for the English empire during the Boer and World Wars.

In Australia, Indian migration significantly increased after the introduction of more open immigration policies (1966–73). Many Indian migrants initially settled in Victoria and New South Wales. Since the 1980s, Indian migrants have accepted employment opportunities in many areas of work including the professions; computer and technical fields; and clerical, sales, production and transport roles. In 2008–09, India was the third highest source country for skilled migrants in Queensland (44).

Indian students comprise the largest cohort of international students in Queensland but, unlike earlier Indian student migrant cohorts, a number of students have been attracted to study vocational occupations such as hair dressing and commercial cookery. From 2000 to 2010, India-born students in Queensland represent a broader socioeconomic demographic. Unlike their predecessors, they are less likely to be from highly educated and higher socioeconomic backgrounds and less likely to occupy highly skilled and paid professions.

From a history of forced migration and indentured labour to more recent migratory patterns based on job opportunities in developed countries, India now comprises a significant Diaspora community, now estimated at 20 million and residing in both long and well-established and new and growing distinct communities in metropolitan and regional centres across the world (45). These communities often retain strong links to their Indian ancestry whether this is in the form of sustaining their cultural, spiritual or linguistic heritage or in the form of financial support and remittances sent back to family members in India (46).

2.2 Languages spoken at home and religions practised

The India-born community in Australia is itself culturally diverse, speaking a number of Indian languages such as Hindi, Tamil, Urdu, Punjabi and Bengali as well as English, and encompassing many religious faiths including Hindu, Sikh, Islam, and Christian. About one third of Queensland's Hindu community was born in India (4425 people) and half of the Sikh community was born in India (1300 people) (47).

India-born Queensland residents speak a number of Indian languages as well as speaking English. In 2006, Hindi was recorded as the most commonly spoken of the Indian languages in Queensland homes. The largest number of Hindi-speaking residents resided in Metro South (4206), Metro North (2075) and Gold Coast (556) health service districts. As a previous British Commonwealth colony, English cultural influences are still evident in India and many Indian people may speak English as a second or third language. However, Indian languages are frequently requested through the Queensland Health Interpreter Service (for example Hindi was the ninth most frequently requested language in May 2010).

2.3 Age and sex distribution

At the most recent Census in 2006, there were 10 955* India-born people living in Queensland compared to almost three million Australian born people. The India-born population recorded its largest population in the 20–39 year age group (Table 1). In 2006, the India-born population was

5_____

* For some demographic indicators the total population number may differ by a few. This is due to the application of randomisation formulas by ABS.

relatively young, with 80 per cent of people aged 59 years or less. In Queensland the sex ratio for India-born people is 82.1 females per 100 males.

Table 1: India-born Queensland population by age, 2006

Age	Per cent
0–19	9.8%
20–39	41.9%
40–59	28.6%
60+	19.6%

Source: Australian Bureau of Statistics (ABS) 2006

2.4 Population size and growth

Queensland's Australia-born population grew by seven per cent in the period 2001–2006. In comparison, the India-born population increased by more than 52 per cent during the same period (Table 2). The 2006 Census indicates a total India-born population of 10 955. Queensland Education and Training International, in 2008, registered 13 062 Indian students. India remains the highest source country for international students in Queensland. In 2009, there were a total of 20 700 students from India.

Table 2: Population growth for Australia-born and India-born Queenslanders, 2001–2006

Country of birth	2001	2006	Percentage change 2001–2006
Australia	2 738 370	2 935 266	7.2
India	7182	10 955*	52.5

Source: Australian Bureau of Statistics (ABS) 2006 (47)

2.5 Geographic distribution

In 2006, the largest numbers of India-born residents were located in Metro South (4271), Metro North (3155) and Gold Coast (1093) health service districts in Queensland.

2.6 Ancestry

At the 2006 Census, there were 26 042 people with Indian ancestry in Queensland. Of those with Indian ancestry, 31 per cent were born in India and 27.1 per cent were born in Australia. Other countries of birth for those with Indian ancestry include; Fiji, South Africa, England, Malaysia, New Zealand, Zimbabwe, Singapore and Kenya (47). This report focuses only on those born in India, not those with Indian ancestry, which would be a much larger and diverse group.

2.7 Year of arrival

India is one of the fastest growing global economies and is one of the largest source countries for skilled labour and international students in Australia and other developed nations. The Indian community in Queensland is a relatively new community group and represents one of the newest migrant 'waves' in Australia: the Indian population has increased in 10 years by 84 per cent. In 1993–94, there were 153 arrivals from India, a number which has increased more than ten fold with 1627 Indian arrivals in 2008–09. In 2008–09, Indian students were the largest cohort of international students arriving in Queensland (20 700).

3 Health and Indian culture

It is important to note that the Indian Queensland population is very diverse in terms of socioeconomic status, religion, age, ethnic origins, identity and culture. Therefore, the concepts of health and Indian culture outlined in this section are not applicable to all India-born Queenslanders. The purpose of this section is to outline some key features of the dominant spiritually and culturally-based health beliefs, traditions, and practises that exist in India today and may be upheld and practiced by persons of Indian ancestry in Queensland.

There are resources available to help health care professionals accommodate cultural and spiritual beliefs in the health care setting. These may include considerations of:

- specific dietary needs
- grooming and dress
- palliative care
- end-of-life practices and decision-making
- the role of family and gender in doctor-patient communication
- observance of important religious traditions, rituals, and celebrations.

These specific considerations are not outlined here; rather, health beliefs, concepts and perceptions about health and wellbeing prevalent in India and Indian migrant populations including the causes, diagnoses and appropriate treatment of illness and disease are summarised. For more information on specific religious and cultural considerations, refer to 'Religion Practices and Health Care' in the Queensland Health Multicultural Clinical Resource (www.health.qld.gov.au/multicultural).

3.1 Indian health beliefs

India has a large number of highly trained and skilled health professionals working both within India and in other countries. Western technology and biomedical practice are therefore trusted and widely adopted. However, a range of more traditional systems of medicine are also often used, either complementarily or in preference to Western medicine, and these long-established traditions and health practices are formally recognised in policy and actively exported by the Indian government (45, 48). Indian health is therefore characterised as 'medical pluralism' where indigenous, folk and well-developed Indian and Western health systems and models co-exist (45, 48, 49).

In addition, migrant Indian population health behaviours may be informed, in part, by their interaction with mainstream health services which may be perceived as unable to consider cultural needs and issues. For example, in their study of Indian families' experience of coronary heart disease treatment in Sydney, Mohan, Wilkes and Jackson found that Indian people expressed dissatisfaction with the lack of recognition of their spiritual beliefs which lead, in some cases, to resistance to their doctor's advice (46). The Indian families in the study placed a high value on putting other needs before their own, avoiding reliance on doctors and medication, and help-seeking behaviours in general. A Canadian study observed similar traits in Indian migrant women who were less likely to view depression as an issue warranting medical attention, seeing it as a personal problem (8). Aspects such as 'tolerance, patience, faith in God's healing powers, and emotional stability' were considered positive attributes of the Indian culture and community that helped them cope with illness (46).

Ayurveda and *yoga* are two Indian health beliefs and practices that are maintained and have even become widely adopted as alternative medical, health and wellness practices by many non-Indian Australians. Because immigrants of Indian background may have both a western and *Ayurvedic* understanding of health and illness, multiple practices may be employed, including remedies found in homeopathy and naturopathy. However, ethnic Indians from Fiji, Malaysia or South Africa may have less understanding of *Ayurvedic* principles. It is important to recognise the heterogeneity of the Indian community in Queensland and that not all Queenslanders of Indian ancestry will follow or share these belief systems. Conversely, it is also important to recognise the influence of

principles founded in *ayurveda*, homeopathy, and yoga in Australia and the integration of these principles into many non-Indian Queenslanders' health beliefs and treatments.

Ayurveda

The most common Indian system of medicine is known as *ayurveda*, which means knowledge or science of life (ayur – longevity; veda – science). Unlike modern medicine, which is preoccupied with the treatment of disease, *ayurveda* is focused on prevention, encompassing a philosophy for living, as well as a holistic system of medicine. Diet and daily exercise are integral to maintaining good health. According to *ayurveda*, good health requires that there is a balance of three humours or 'doshas': bile (fire), phlegm (water) and wind (vatta). Diagnosis according to *ayurveda* is based on investigating the root cause of a disease, which may be outside the body, and will be informed by an assessment of the humours and achieving equilibrium through diet, herbal remedies, meditation or yoga. Much of *Ayurvedic* treatment is based on over 1400 plants extraction and herbal remedies. A 'baid' (or 'vaid') is the name for an Ayurvedic practitioner and many Hindus will consult a baid before seeing a Western doctor (45, 48-50).

Yoga

Yoga is central to Indian and *Ayurvedic* conceptualisations of wellbeing. Yoga may also be seen as a cure for a range of ailments such as back or stomach pain. Like *Ayurvedic* principles, yoga is focused on preventative and holistic concepts of health and wellbeing. Yogic practice is predicated on equilibrium, mind-body harmony, and meditative states, and is considered a means to enlightenment for spiritual practices and beliefs in India (50).

Within traditional *Ayurvedic* Indian beliefs of physical activity, breathlessness and overexertion from exercise are to be avoided. Physical activity should be gentle and fluid and not too much stress or strain on the body. Even some of the forms of yoga popular in Australia (particularly those with an emphasis on physical exertion over spirituality) are not consistent with the traditional Indian view of physical activity and the role and purpose of exercises such as yoga and may not be considered authentic or appropriate to India-born Queenslanders (51).

Bhakti yoga is the most popular form of yoga in India. It is believed to satisfy the longing for a more emotional and personal approach to religion and involves devotion to one of the many personal gods and goddesses of Hinduism. Such devotion is also expressed through acts of worship, temple rituals, and pilgrimages.

'The Evil Eye' (*Nazar*)

As in many other cultures, the concept of the 'evil eye', or the malevolent gaze, is a belief that may be strongly held by Indian people and is considered a determinant of poor health. Envy or jealousy are thought to prompt the evil eye which can then result in illness or catastrophe. As a result, persons who might induce envy (good-looking children, healthy families, brides and grooms) are considered to be most susceptible to receiving the evil eye. A number of rituals or practices may be employed to ward off the evil eye. Waving salt or salt water over the head of the affected person and throwing it in fire or water is one of the most common ways of removing the effects of the evil eye. Protective measures are applied particularly to infants and small children who may be made to wear special, protective charms, amulets and lockets, with each serving a different purpose. One of the most popular charms against the evil eye is the application of eyeliner to children's eyes and a small black dot (*kala tika*) to their forehead. This mark is believed to mar their beauty and make them unappealing to the evil eye. If a child is exposed to the evil eye 'the mother takes the dust from the footsteps of the person who is responsible for having cast an evil eye; the dust is roasted over a fire and then thrown away' (48). Chillies may be roasted around the head of the child and then burned (53).

3.2 Indian spiritual beliefs and health

Cultural and spiritual beliefs are intertwined in India, and spiritual beliefs are infused and upheld in daily activities such as diet, exercise, and work. Spiritual healing is also integral to Indian health belief systems where meditation and prayer can transmit healing energies, transcend the body and

unify mind, body and spirit. The following are aspects of the main religions in India and their potential influence on health beliefs:

Hinduism and health

- Karma—a law of behaviour and consequences in which past actions, including those from past lives, affect the circumstances in which one is born and lives in this life. Thus a patient may feel that his or her illness is caused by karma (even though there may be complete understanding of biological causes of illness). In addition, pain is attributed to God's will, the wrath of God, or a punishment from God and is to be endured with courage (54, 55).
- Reincarnation is strongly believed in Hinduism. It is the belief that, after death, the soul comes back to earth in another body or life form. It signifies that life is cyclical, involving the transmigration and constant rebirth of souls.
- Vegetarianism is universal among devout Hindus. Vegetarianism among Hindus is based on belief in reincarnation, the idea that the soul of a person enters back into creation as a living being. Hindus pray a specific prayer before eating, in which one asks forgiveness for eating a plant or vegetable in which a soul could dwell.
- Strong beliefs in astrology. The movement of the planets has a major influence on human life. Illness may be attributed to supernatural causes and misalignment of planets (56).
- Pain and suffering may be seen as the result of sinful acts/deeds in this or previous lives. This belief may impact the individual's self-report of pain levels. Meditation may be used as an intervention to manage pain instead of pain medications (54, 56).

Islam and health

- Islam has a longstanding tradition of medicine with many Western medical practices having their origins in Islam.
- Health tends to be viewed holistically. As in Indian health beliefs, Western and more traditional health beliefs co-exist.
- A 'hakim' is a traditional Arabic doctor. A hakim practices traditional medicine, homeopathy, naturopathy, chiropractic and other similar practices.
- The preservation and sanctity of life is at the core of Islam beliefs about health and life.
- Predestination is also a commonly held belief that may lead to fatalistic attitudes about health and wellbeing (57).

Sikhism and health

- Central to Sikh's belief system is the equality of all people in God's eye and the notion of reincarnation—that the soul of a person is reborn in another person's or animal's body. One's next life depends on the good deeds of his or her previous life
- Illness may be considered God's will but individuals must make an effort to get well.
- Meditation, as well as being central to Sikh spirituality, is also central to Sikh health and wellbeing, including mental health and inner peace.
- Devout Sikhs are vegetarians.
- Suffering stems from two sources—failure to appreciate God's creation and failure to control the mind (55, 58).

4 Wellness and illness: the health status of Queenslanders born in India

4.1 Self-reported health and quality of life

The 2007 National Health Survey presented data relating to self-reported health status and quality of life at a national level. Data are not routinely available by country of birth as analysis is limited by small numbers of overseas born participants. However, a 2008 report by the Chief Health Officer of New South Wales (incorporating survey data of approximately 44 000 New South Wales residents), noted that overall 80.4 per cent of New South Wales adults rated their health positively compared to 91.8 per cent of New South Wales adults born in India. This difference was statistically significant (59).

4.2 Life expectancy

The life expectancy of the Queensland population (including Australian and overseas-born) in 2008 was 78.9 years for males and 83.7 years for females (3). The relatively small number of India-born Queenslanders prevents meaningful country of birth specific life expectancy calculations from being made.

4.3 Infant mortality and health

During the period 2006–07, there were 435 infants born to women who recorded India as their country of birth. The number of perinatal deaths (stillbirths and deaths to infants in the first 28 days of life) was six (60). The perinatal mortality rate was higher for infants born to Indian-born mothers compared to all Queensland mothers; however, the difference was not statistically significant. For the same period, of the 435 births recorded to India-born mothers, 39 occurred before 37 weeks gestation and were therefore classified as pre-term births. The rate of pre-term birth was similar for India-born mothers (89.7 per 1000 births) compared to all Queensland mothers (88.7 per 1000 births) (60).

4.4 Deaths – all causes and avoidable

Almost two-thirds of all deaths of Queenslanders aged less than 75 years in 2006–07 were considered to have been potentially avoidable under nationally agreed criteria (3).

In 2006, India-born Queenslanders had a similar standardised mortality ratio for all causes as the total Queensland population (Figure 1).

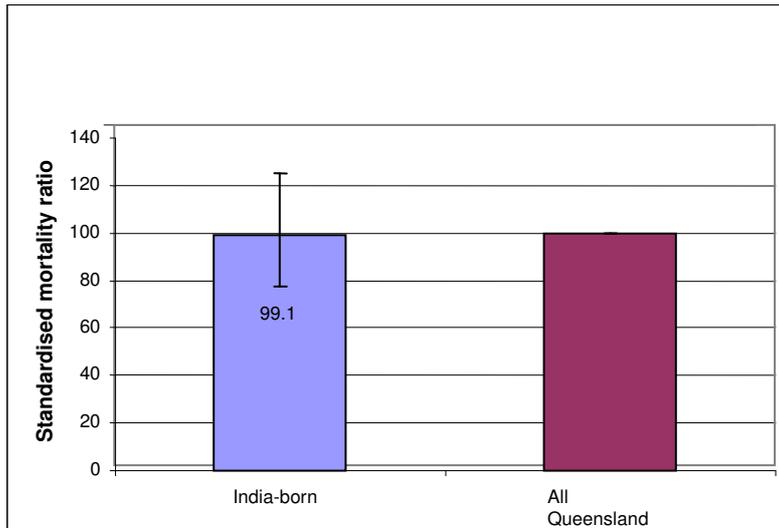


Figure 1: All causes standardised mortality ratio India –born and all Queensland persons, 2006
 (Source: Causes of Death, ABS)

In 2006, there was no difference in the standardised mortality ratio for ‘total avoidable conditions’ up to 74 years of age, for India–born Queenslanders (64.2) compared to all Queenslanders (Figure 2).

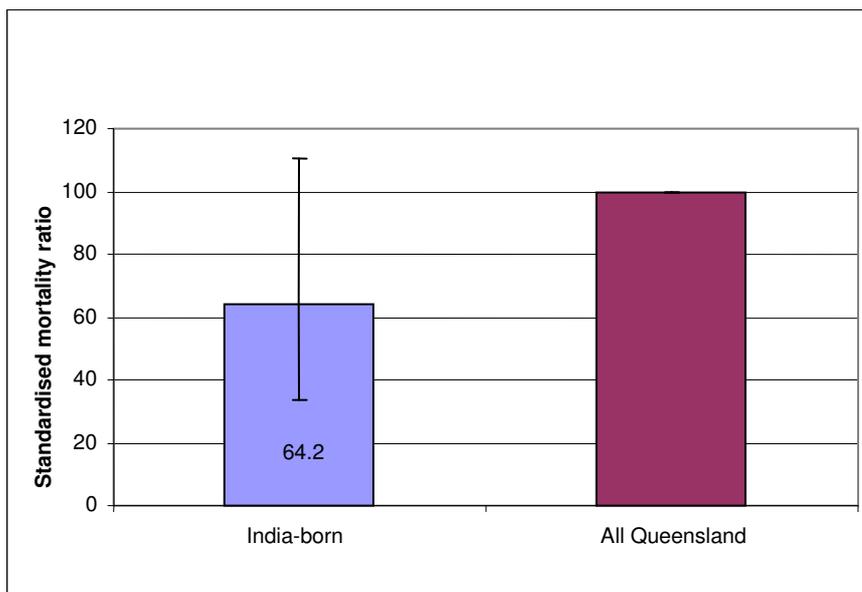


Figure 2: Total avoidable conditions (up to 74 years) standardised mortality ratio India–born and all Queensland persons 2006
 (Source: Causes of Death, ABS)

4.5 Hospital separations – all causes and avoidable

Hospitals are a vital and highly visible parts of the health system. A hospital separation is an episode of care which can be a total hospital stay or a portion of a hospital stay ending in a change of status (for example from acute care to rehabilitation). Hospital separations are often used to compare levels of illness in populations but should be interpreted with caution: as they also reflect access to hospitals, the need for repeated admissions and current medical practice of treating an illness or injury. All these factors can vary over time and between geographic areas (3). Hospital separation data were sourced from the Queensland Hospital Admitted Patient Data Collection.

Figure 3 presents the standardised hospital separation ratio for all causes (July 2006 to June 2008), for India-born Queenslanders and all Queenslanders. The rate of hospitalisation for all causes was 14.2 per cent lower in India-born Queenslanders, compared to the total Queensland population.

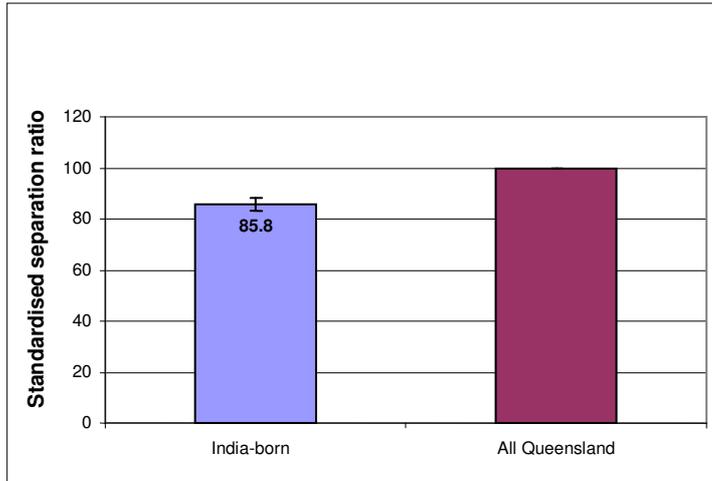


Figure 3: All causes standardised hospital separation ratio, India-born and all Queensland persons, July 2006—June 2008
(Source: Queensland Hospital Admitted Patient Data Collection)

The standardised hospital separation ratio for the same period, for selected total avoidable hospitalisations, is presented in Figure 4. India-born Queenslanders had a ratio of 78.1 per cent, which was lower than the ratio for all Queenslanders.

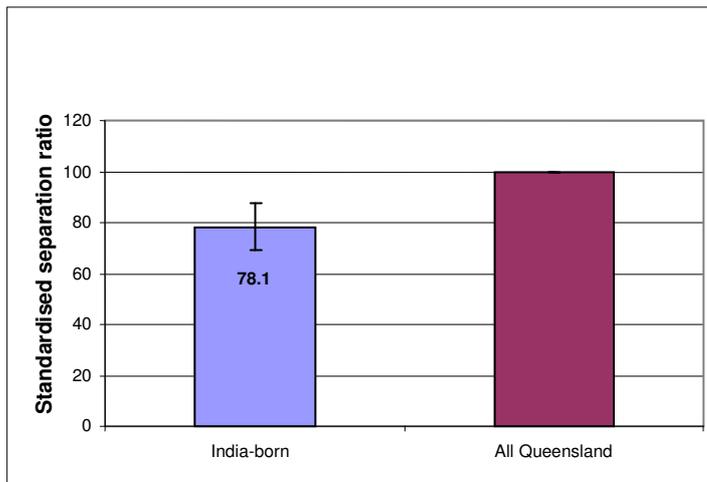


Figure 4: Total avoidable standardised hospital separation ratio, India-born and all Queensland persons July 2006—June 2008
(Source: Queensland Hospital Admitted Patient Data Collection)

5 Determinants of Indian health and wellbeing in Queensland

Determinants of health and wellbeing refer to the factors that influence the health status of populations and individuals. There are many determinants that can impact on an individual's health status and health behaviours. AIHW has developed a conceptual framework for understanding the determinants of health (Figure 5) (61). As depicted in the framework, upstream factors include broad features of society such as culture and social cohesion, environmental factors, socioeconomic characteristics and knowledge, attitudes and beliefs can impact on health behaviours which include physical activity. The results of these influences are also bi-directional, so some of the factors that are further downstream such as biomedical factors can also have an impact on physical activity.

These determinants are complex, and can help to explain some of the disparities in health status and health behaviours relating to individuals from the Indian community in Queensland relative to the non-Indian Queensland population.

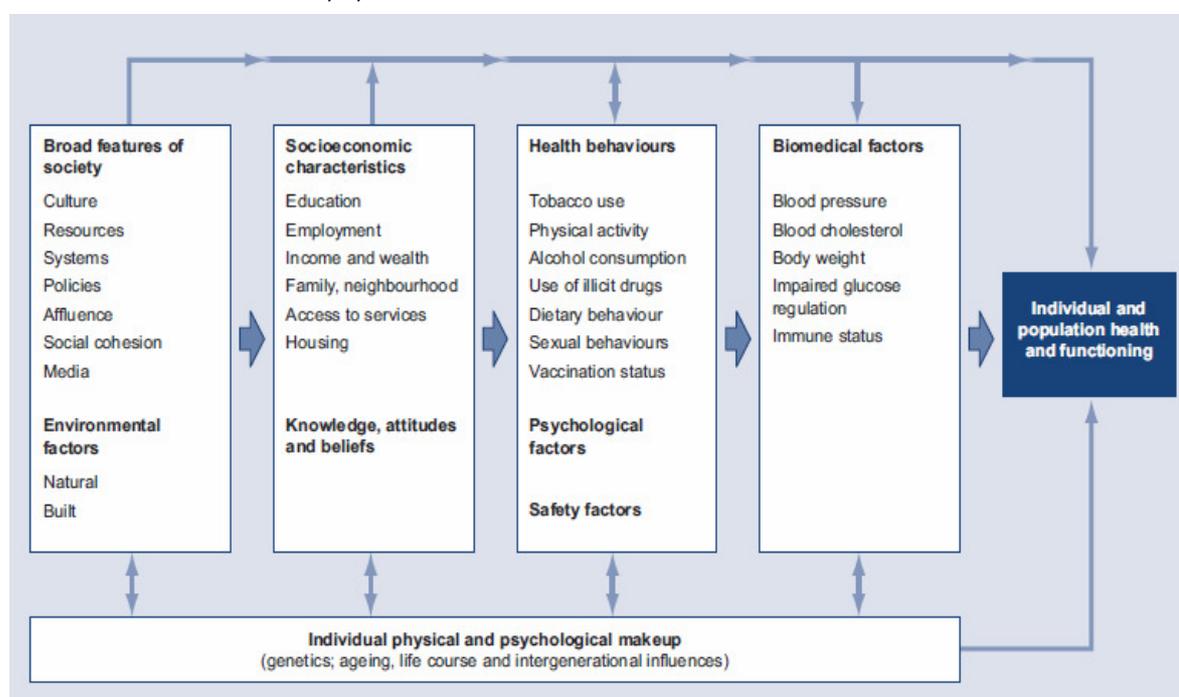


Figure 5: Conceptual framework for the determinants of health (Source: Figure 4.1 AIHW, 2008a)

WHO recognises marginalisation and experiences of racism as linked to the social determinants of health (62). Migration itself is understood to be a significant stressor and the mode in which migrants enter the country is also a predictor of their capacity to manage their health, access and navigate the health system. The Australian Government Compendium of Social Inclusion Indicators recognises that a refugee background, in particular, is an indicator of poorer health outcomes. The Compendium found that low-English proficiency speaking households were more vulnerable to persistent poverty as well as social exclusion which are also strongly linked to poor health literacy and health outcomes (63). The experiences of racism, and both the real or perceived threat of verbal and physical racist abuse, have been shown to be a potential determinant of poor health and wellbeing (64).

In addition to the experience of emerging and growing migrant communities, the literature clearly indicates that young Australians with mixed ancestry and parents from culturally and linguistically diverse backgrounds are vulnerable to experiencing stressors and difficulties negotiating intercultural and intergenerational demands and expectations. The desire to 'fit in' to mainstream

Australian culture may override parents' expectations of maintaining cultural practices and traditions; this in turn may cause conflict and distress for migrant families (65).

5.1 Risk factors and health behaviours

Overview

Public health literature has extensively documented the key lifestyle risk factors that contribute to the incidence and prevalence of disease and death. Factors such as tobacco smoking, excessive alcohol consumption, poor diet and nutrition, physical inactivity as well as biological predispositions including low birth weight, high blood pressure, overweight and obesity, and poor blood glucose control are all attributable to chronic disease. Multiple risk factors increase likelihood of poor health outcomes. Data is presented on three leading risk factors[†].

Smoking

Tobacco smoking is a leading risk factor for chronic disease in Queensland and remains a leading cause of preventable death and health inequality (3).

Information on smoking by India-born Queenslanders is not available and only limited interstate data is available. The National Drug Strategy Household Survey (NDSHS) collects information relating to tobacco, alcohol and illicit drug use across Australia. In 2007, 23 356 participants completed the survey. Overall, 16.6 per cent of participants reported being daily smokers (66). When data are examined by country of birth, 17 165 participants recorded Australia as their country of birth when answering questions relating to their tobacco smoking behaviours and of these participants, 3003 (17.5 per cent) reported being daily smokers. The sample size of India-born participants was too small for meaningful statistical analysis.

The New South Wales Health Population Survey found that, for the period 2002–05, 14.2 per cent of the 267 Indian people surveyed were daily or occasional smokers (37).

Alcohol

Alcohol is the most commonly used drug in Australia with high levels of drinking known to increase the risk of acute and chronic health, negative social impacts and premature death (67). While there are no data on alcohol consumption among the India-born population of Queensland, there is limited interstate data.

In the 2007 NDSHS, 10.3 per cent of all participants reported alcohol consumption considered risky or high risk to their long-term health (68). Of Australia-born participants answering this question 11 per cent (17 178) reported alcohol consumption which put them at risk or high risk of harm to their long-term health. The number of India-born participants surveyed in Queensland (11) was too small for meaningful statistical analysis.

In a New South Wales population health survey involving 257 Indian participants, 13.4 per cent of persons born in India report risky alcohol drinking (37). Again, this finding is gendered but with a sharp increase in Indian women reporting risky drinking; for the 2002–05 reporting period, 20.4 per cent of India-born women were found to be engaging in risky alcohol drinking compared to 9.5 per cent of men, a trend that reverses the 1997–1998 finding where 20.6 per cent of Indian men drank at risky levels and 8.9 per cent of women (37).

Physical inactivity

In 2010, about half of Queensland adults were participating in sufficient physical activity for health benefit (3). It is estimated that physical inactivity is the fourth highest contributor to the burden of disease and injury in Australia, contributing to 6.7 per cent of the total burden (69). Physical inactivity contributes to increasing cardiovascular risk, overweight, high blood pressure, type 2 diabetes and some types of cancer (70). Regular physical activity reduces the risks of many chronic diseases, particularly cardiovascular disease and type 2 diabetes.

14 _____

[†] Data are not available by specific country of birth for some risk factors.

Rates of participation in physical activity are lower in individuals from non-English speaking backgrounds compared to the Australia-born population. The 2006 General Social Survey indicated that individuals who were born in a non-English speaking country had a participation rate in sport and physical activity of 37.9 per cent (defined as participation in sport or recreation in the last 12 months). Those born in main English speaking countries had a participation rate of 65.4 per cent, born in proficient English speaking countries 56.6 per cent and born in Australia 63.9 per cent (71).

In Queensland, the participation rate for individuals born in a country not proficient in English was 31.6 per cent, for individuals born in main English speaking countries it was 71.3 per cent, for individuals born in a country proficient in spoken English it was 63.9 per cent and for individuals born in Australia it was 64.5 per cent.

5.2 Protective factors

Breastfeeding

Infants and children depend on good nutrition for normal growth and development. The benefits of such nutrition last throughout life and directly influence a range of childhood conditions including overweight and obesity and dental disease. Good nutrition in infancy and childhood can also prevent diet-related diseases in later life (72).

During 2006, 165 infants were born to India-born mothers in Queensland hospitals and of these, 142 infants (86.1 per cent) were being exclusively breastfed at discharge following birth (60). This is slightly higher than exclusive breastfeeding rates by Australia-born mothers (83.3 per cent). No breastfeeding data are available at six months of age by mothers' country of birth; however, all Queensland rates at 2006 were known to be 57 per cent, which fell well below the national objective of 80 per cent.

Cancer screening

Cancer screening is the use of a test to identify the early stages of the disease before symptoms are present. Currently, national screening programs are in place for breast cancer, cervical cancer and bowel cancer (3).

Participation rates in these screening services by individual country of birth are not available. However, the Department of Health and Aging reports that a number of barriers may affect participation, particularly in CALD populations (73). These barriers include:

- language
- cultural and religious beliefs
- lack of awareness of screening programs
- lack of understanding and knowledge of preventive health
- culturally inappropriate services
- embarrassment and fear
- family obligations
- transport
- finance.

Immunisation

Childhood immunisation

A number of communicable diseases are vaccine preventable through immunisation. Childhood immunisation prevents a range of diseases including measles, polio, pertussis, chickenpox, hepatitis B, meningococcal, pneumococcal and rotavirus diseases (3). Free vaccines are provided to Queensland children under the National Immunisation Program.

In June 2010 the target vaccination coverage rate of 90 per cent fully immunised was achieved in Queensland for all cohorts (3). Data are not available to provide vaccination rates by country of birth.

6 Hospitalisations

6.1 Cancer

Cancer is the name used for a cluster of diseases for which the main characteristic is the development of abnormal cells which spread rapidly within the human body and is the leading cause of the burden of disease and injury in Queensland (2). Prostate, lung, colorectal and melanoma cancers accounted for 63 per cent of new cases for males in 2007. Breast, lung, colorectal, melanoma and cervical cancer accounted for 61 per cent of new female cancers (3).

The standardised hospital separation ratio for all cancers excluding non-melanocytic skin cancers (July 2006 to June 2008) for India-born Queenslanders and all Queenslanders is presented in Figure 6. The India-born population had a ratio half that of all Queenslanders.

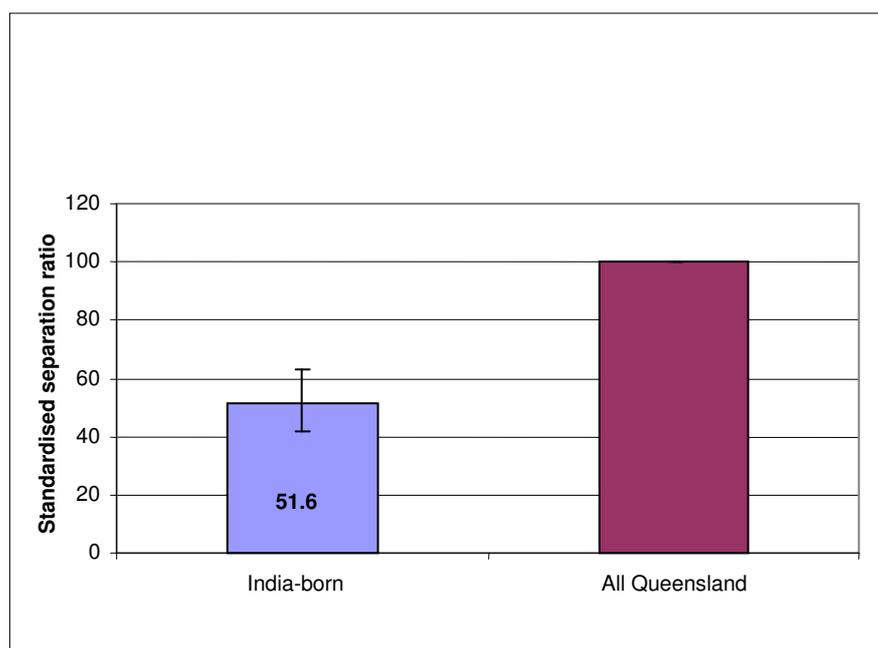


Figure 6: All cancers (excluding non-melanocytic skin cancers C44) standardised hospital separation ratio India-born and all Queensland persons, July 2006–June 2008 (Source: Queensland Hospital Admitted Patient Data Collection)

6.2 Cardiovascular disease

Cardiovascular health refers to any disease of the heart and blood vessels and is the leading cause of death in Queensland (3).

Coronary heart disease (heart attack and angina)

The standardised hospital separation ratio for coronary heart disease (July 2006 to June 2008) for India-born Queenslanders compared to all Queenslanders is shown in Figure 7. India-born Queenslanders had a similar ratio to that of all Queenslanders.

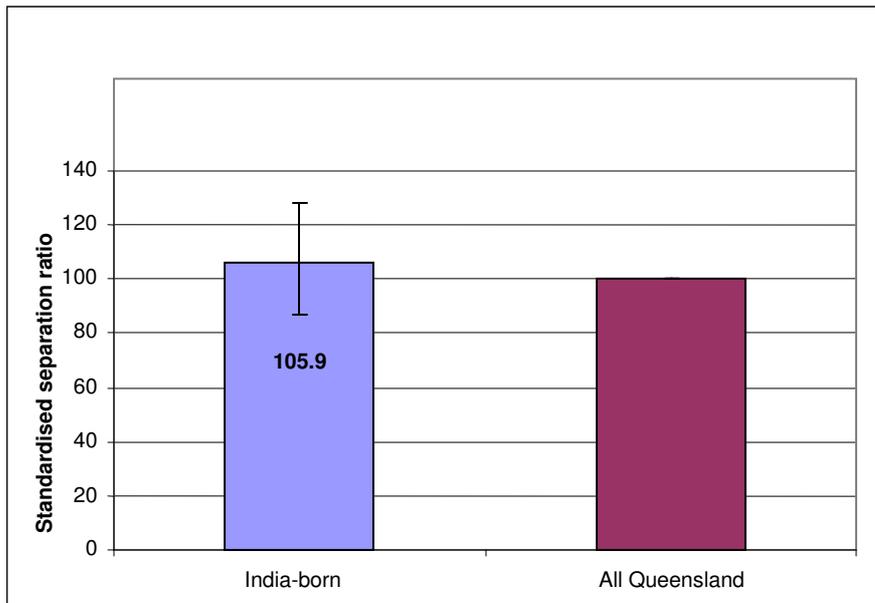


Figure 7: Coronary heart disease standardised hospital separation ratio India-born and all Queensland persons July 2006—June 2008
 (Source: Queensland Hospital Admitted Patient Data Collection)

Stroke

Stroke, or cerebrovascular disease, occurs when the blood vessels supplying part of the brain become blocked or burst.

Figure 8 presents the standardised hospital separation ratio for stroke, India-born and all Queenslanders, for the period July 2006 to June 2008. India-born Queenslanders had a similar ratio to that of all Queenslanders.

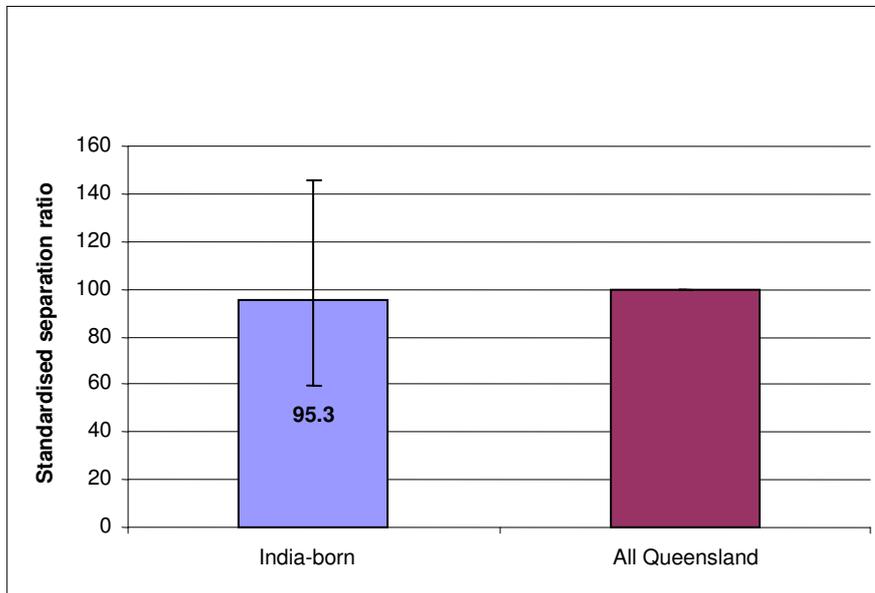


Figure 8: Stroke standardised hospital separation ratio India-born and all Queensland persons July 2006—June 2008
 (Source: Queensland Hospital Admitted Patient Data Collection)

6.3 Diabetes

Diabetes mellitus (diabetes) is a chronic metabolic condition in which the body produces inadequate insulin or is unable to use properly the insulin it produces, resulting in improper control of blood glucose (3).

The standardised hospital separation ratio for diabetes, India-born compared to all Queenslanders (July 2006 to June 2008), is presented in Figure 9. India-born Queenslanders had a similar ratio (100.4) to all Queenslanders.

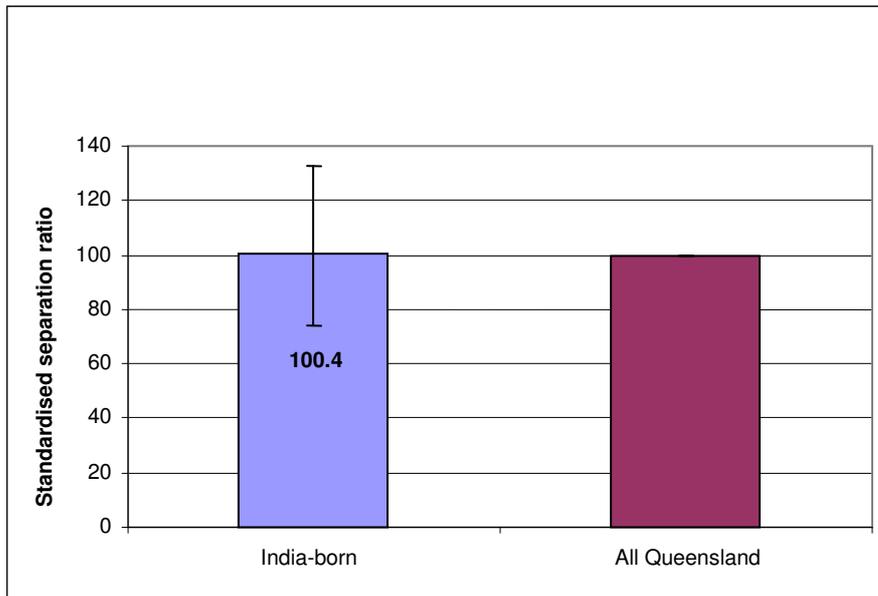


Figure 9: Diabetes standardised hospital separation ratio India-born and all Queensland persons July 2006—June 2008
(Source: Queensland Hospital Admitted Patient Data Collection)

The standardised hospital separation ratio for diabetes complications for the same period is presented in Figure 10. India-born Queenslanders also had a similar ratio to all Queenslanders.

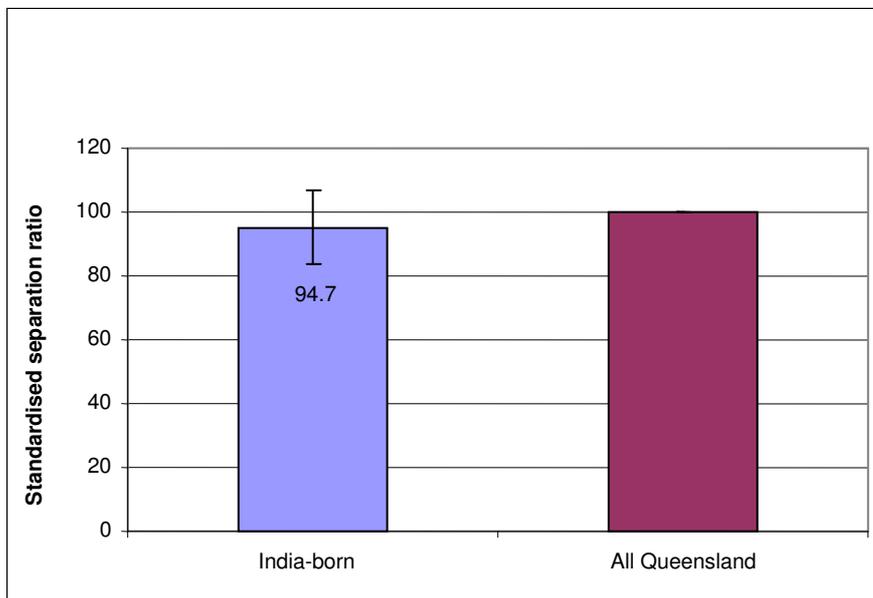


Figure 10: Diabetes complications standardised hospital separation ratio India-born and all Queensland persons July 2006—June 2008
(Source: Queensland Hospital Admitted Patient Data Collection)

When considering standardised hospital separation ratios for diabetes excluding renal dialysis, India-born Queenslanders also had a similar ratio to the ratio of all Queenslanders (Figure 11).

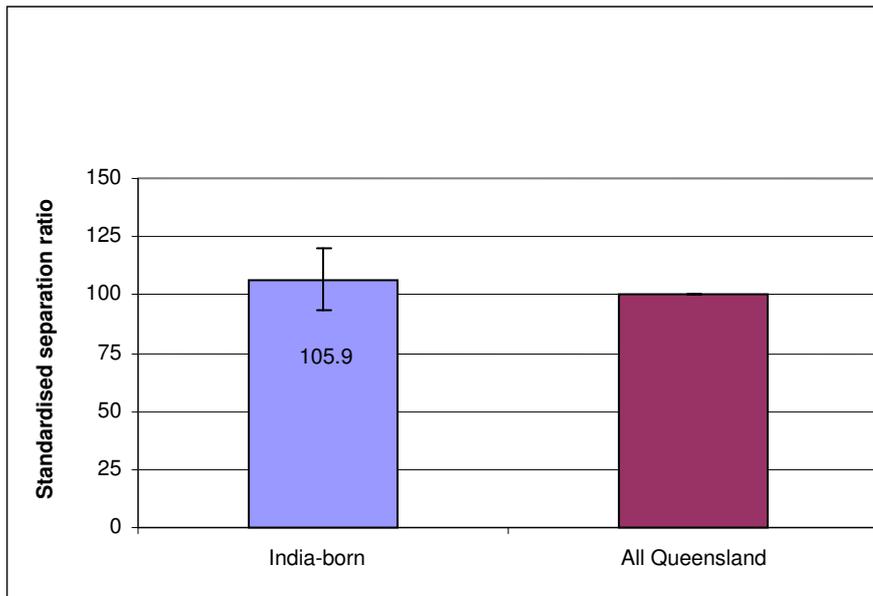


Figure 11: Diabetes complications (excluding renal dialysis) standardised hospital separation ratio India-born and all Queensland persons July 2006—June 2008
(Source: Queensland Hospital Admitted Patient Data Collection)

Coding for diabetes, particularly diabetes complications, has varied from year to year over the past decade and this limits the reliability of data for this disease. Data for diabetes complications should be interpreted with caution (3).

6.4 Mental health

Mental health problems and mental disorders refer to the spectrum of cognitive, emotional and behavioural disorders that interfere with the lives and productivity of people (74). An individual's mental health is derived from their genetic makeup and general life circumstances, including their social, economic and environmental situation. Mental health problems and mental disorders refer to the spectrum of cognitive, emotional and behavioural disorders that interfere with the lives and productivity of people (74).

A mental disorder is a diagnosable illness and differs from mental health problems in duration and severity. Mental disorders of concern to public health concern include depression, anxiety and substance use disorders. Mental disorders represent an immense psychological, social and economic burden to society, and also increase the risk of physical illness (75).

Data relating to mental health by specific country of birth is not available for Queensland. However, in a 2008 New South Wales Chief Health Officer Report limited country of birth specific data was published (59). This data suggests that in the measurement of psychological distress, India-born participants scored similar levels of distress to Australia-born participants.

6.5 Respiratory disease

Respiratory diseases are numerous and varied, are the third largest cause of death in Queensland and the seventh largest cause of hospitalisation (3). The two major chronic respiratory diseases that contribute the greatest burden are asthma and chronic obstructive pulmonary disease (3).

Asthma

The most notable respiratory disease is asthma which is a chronic respiratory disease characterised by recurrent attacks of episodes of wheezing, chest tightness and shortness of breath due to widespread narrowing of the airways and obstruction to airflow. There is no cure for asthma partly due to the lack of complete understanding of the causes of the disease (76). Asthma is a leading cause of disease burden in children and young people.

For the period July 2006 to June 2008, there was no difference in the standardised hospital separation ratio for asthma for India-born Queenslanders compared to all Queenslanders (Figure 12).

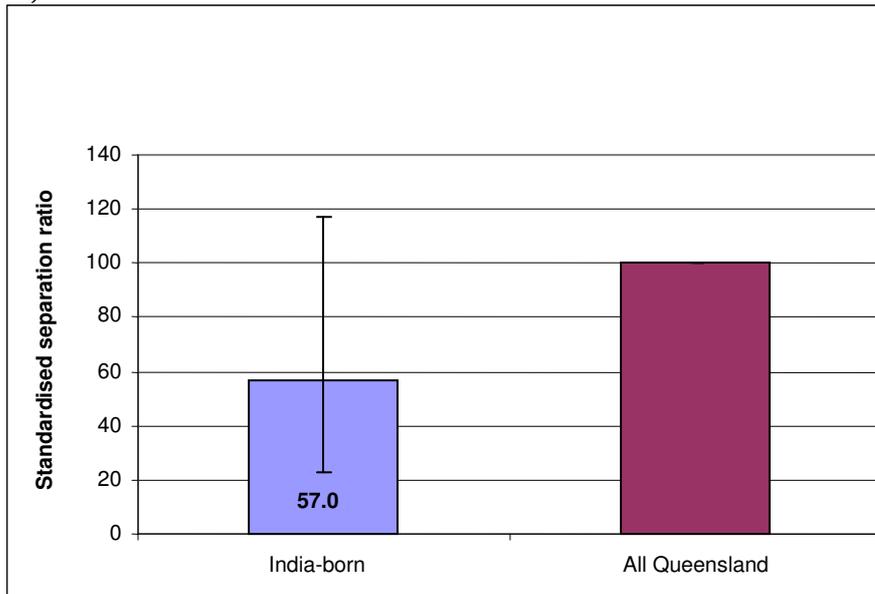


Figure 12: Asthma standardised hospital separation ratio India-born and all Queensland persons July 2006–June 2008
(Source: Queensland Hospital Admitted Patient Data Collection)

Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) is a serious and progressive disease which involves destruction of lung tissue and narrowing of the air passages, causing chronic shortness of breath. The main form of COPD is emphysema (2).

Figure 13 presents the standardised hospital separation ratio for COPD, India-born Queenslanders compared to all Queenslanders, for the period July 2006 to June 2008. India-born Queenslanders had a ratio of approximately half to that of all Queenslanders.

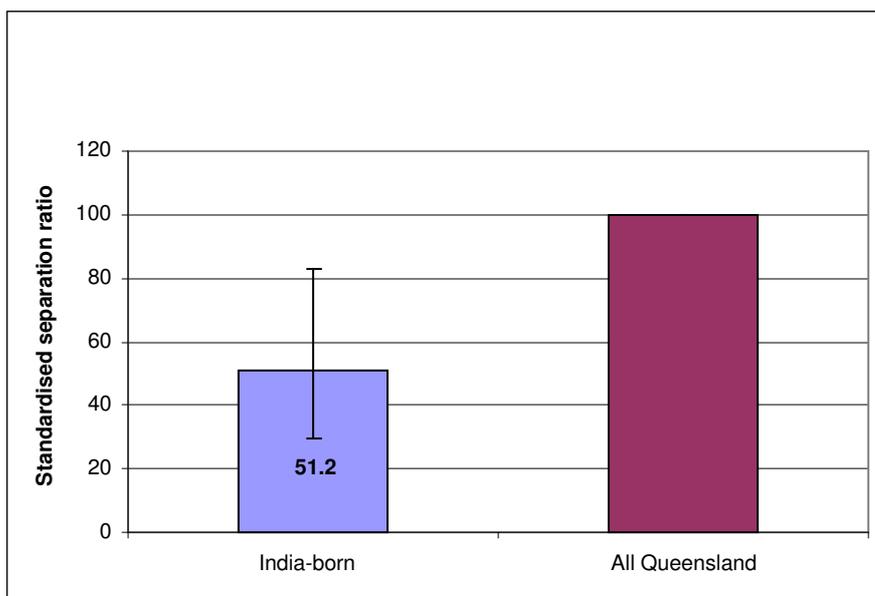


Figure 13: COPD standardised hospital separation ratio India-born and all Queensland persons July 2006–June 2008
(Source: Queensland Hospital Admitted Patient Data Collection)

6.6 External causes

Injuries accounted for 7.1 per cent of the total burden of premature death and disability in Queensland in 2007. Road traffic injuries and falls were responsible for the largest proportion of unintentional injuries and suicide and self inflicted injuries were the leading cause of intentional injury (3).

Over the past 10 years in Queensland, there have been major reductions in the rate of death for a number of injury types. However, data are not available by specific country of birth. These reductions occurred for important causes of death for (77):

- young children (drowning, burns and scalds)
- young people (transport)
- working age adults (homicide)
- older people (falls)
- people of all ages (transport).

Injuries in this category are preventable, and the strategies to prevent them are as wide ranging and diverse as their causes .

For the period July 2006 to June 2008, the standardised hospital separation ratio for external causes, India-born Queenslanders compared to all Queenslanders was approximately half the ratio (Figure 14).

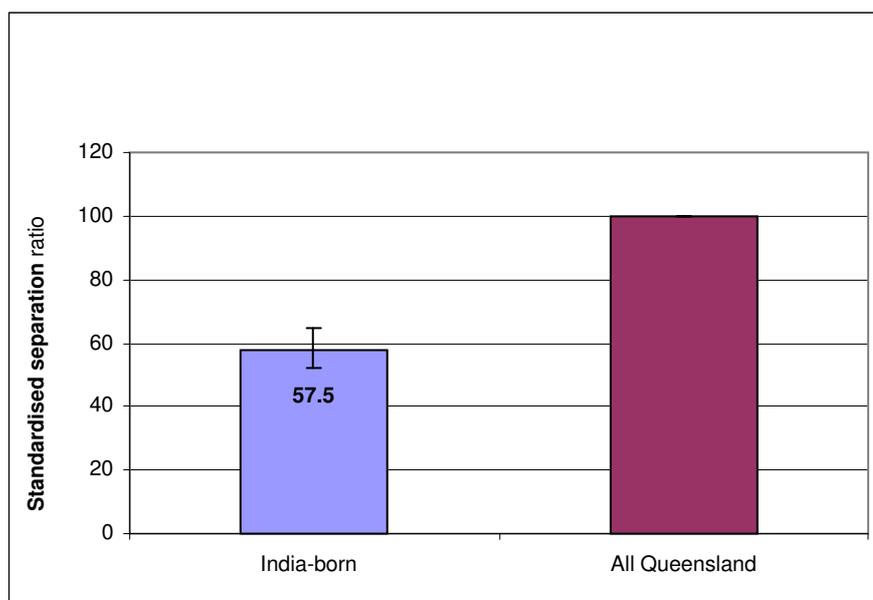


Figure 14: External causes standardised hospital separation ratio India-born and all Queensland persons July 2006–June 2008
(Source: Queensland Hospital Admitted Patient Data Collection)

6.7 Musculoskeletal disease

Musculoskeletal conditions include arthritis and other joint problems and disorders of the bones, muscles and their attachments to each other. Arthritis and musculoskeletal conditions are the world's most common cause of severe long term pain and physical disability (78).

In 2004–05, one in three Queenslanders reported having a musculoskeletal condition of at least six months duration, with 16 per cent of Queenslanders reporting arthritis. The prevalence of arthritis was higher in females (18 per cent) than males (14 per cent). The prevalence of arthritis increases with age.

Approximately 633 000 Queenslanders (17 per cent of the population) reported a long term back problem in 2004–05. Back pain prevalence begins to increase in the teenage years and peaks in the middle years. In 2005, 17 per cent of Australians presenting to a GP did so for arthritis with osteoarthritis the most common complaint (79). Back complaints were also a common cause of GP contact, accounting for about eight per cent of GP presentations in 2005.⁷³ Arthritis and back pain were often identified as co-morbid conditions when people presented to a GP for other chronic conditions (80).

For the period July 2006 to June 2008, the standardised hospital separation ratio for musculoskeletal disease for India-born Queenslanders, was lower than all Queenslanders (Figure 15).

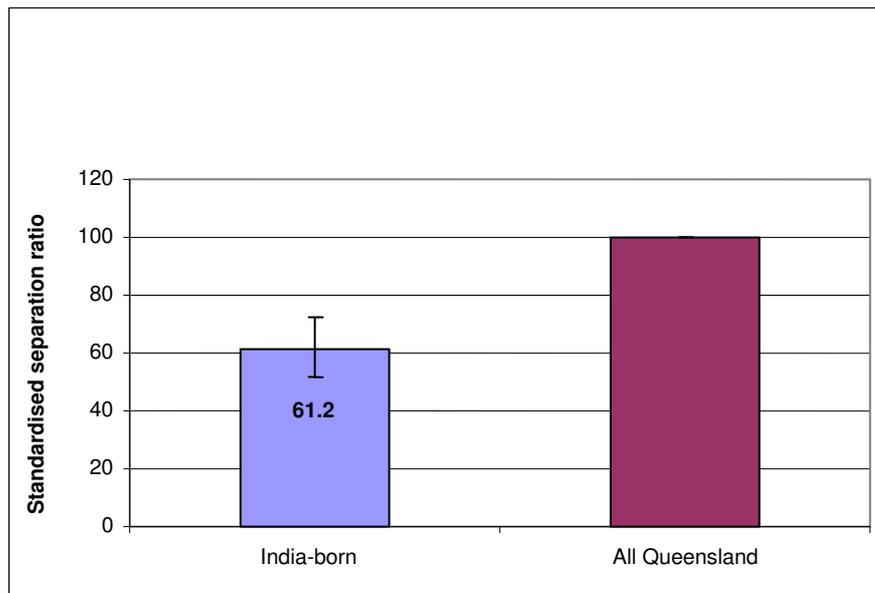


Figure 15: Musculoskeletal disease standardised hospital separation ratio India-born and all Queensland persons July 2006–June 2008
(Source: Queensland Hospital Admitted Patient Data Collection)

6.8 Communicable diseases

In Queensland, infectious and parasitic diseases account for a low level of the burden of disease. This is due to current levels of investment in communicable disease surveillance and control.

Prevention (including vaccination), screening, treatment, control and monitoring of a range of communicable diseases is undertaken in Queensland. Communicable diseases include (3):

- mumps
- measles
- rubella
- hepatitis
- pertussis
- tetanus,
- influenza
- sexually transmissible diseases
- food borne illnesses
- vector (such as mosquito) borne diseases
- tuberculosis
- diseases transmitted by animals (zoonotic diseases).

Current data collection standards do not include country of birth as a mandatory field. Therefore it is not possible to report communicable diseases by country of birth.

7 Key implications for Queensland Health

The India-born population of Queensland had lower hospitalisations for all causes, and avoidable conditions, chronic obstructive pulmonary disease, all cancers, external causes and musculoskeletal conditions. The Queensland India-born population did not differ from the general Queensland population on any other cause of hospitalisation studied in this document, or in relation to all causes or avoidable mortality. Risk factor information is extremely limited with small sample sizes in national surveys, or the lack of specific country of birth or ethnicity data making strong conclusions about risk difficult to reach.

Taking these findings together, the Indian community is a relatively healthy community. This likely reflects the fact that the India-born population is a significantly younger and newer community. Eighty-four per cent of the Indian population in Queensland has arrived in the last 10 years. The healthy migrant effect that results from screening entrants (both through government screening and through self-selection) is likely to still be influential. The 'healthy migrant effect' is generally maintained in the first five to ten years of migration (4-8).

The implications for Queensland Health are clear from international and national evidence, as well as evidence from other states where Indian migrant communities have long been established, that as it ages, the Indian migrant community is at risk of much higher prevalence of diabetes and cardiovascular disease, compared to host and other migrant populations. The focus in Queensland, therefore, needs to be on prevention of chronic disease as the health of this community worsens over time as acculturation takes place and the 'healthy migrant effect' dissipates. The findings also indicate a need for better data collection and analysis, and the need for population health surveys that specifically target culturally and linguistically diverse populations

Appendix 1 Data and methodology

All data sources are cited. For further information contact the Director, Queensland Health Multicultural Services.

Unless otherwise indicated all data refer to the total population (0–85+ years).

Australian Bureau of Statistics (ABS) data are used with permission from the ABS. Copyright in ABS data vests with the Commonwealth of Australia.

Hospital separation data were derived from the Queensland Hospital Admitted Patient Data Collection, including private and public hospitals. All disease specific hospital separations were derived using the principal diagnosis of inpatient episodes of care. All separations were coded using the International Classification of Diseases version 10 Clinical Modification (ICD–10–CM) using standard code sets (81).

Death, cancer incidence and hospitalisation ratios for all diseases and conditions are reported as age standardised ratios. Standardisation minimises the differences in age composition among populations and facilitates comparisons among populations. In direct standardisation, the proportional age distribution of the standard population is applied to the ratio to obtain age standardised ratios which minimise or remove the distorting effects of age. In indirect standardisation, the age distribution of the standard population is used to obtain expected counts, total number of expected counts and subsequently standardised ratios (standardised mortality ratio or standardised separation ratio etc).

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