Gold Coast Hospital and Health Service

Notifiable Diseases and Immunisation 2014

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Gold Coast Health
Building a healthier community

Queensland Government

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Foreword

Public Health plays a leading role in the prevention, surveillance and control of communicable diseases in the Gold Coast. These activities are carried out by a multidisciplinary team of physicians, nurses, environmental health officers, data officers, epidemiologists and business support.

As the Gold Coast remains a major national and international tourist destination, and the local population continues to grow and age, the incidence and associated risk of communicable diseases will evolve. It is important the Gold Coast Hospital and Health Service is abreast of the diverse issues our population faces. This report provides a current overview of rates and trends for selected notifiable diseases and immunisation.

Despite the significant impact of communicable disease control and immunisation, Public Health is currently allocated less than one percent (0.4%, GCPHU) of the Hospital and Health Service budget. Population changes and fiscal pressure will continue to present challenges to implement a world-class health service to the Gold Coast community. These challenges will only be overcome through collective contributions across a continuum of care from preventive health to tertiary service delivery.

Moving forward, Gold Coast Public Health Unit is committed to providing a safe, responsive and financially sustainable health service. Maintaining a robust evidence base, promoting innovation and enhanced practice, and working in partnership with key stakeholders are at the core of our working ethos.

Sharon Jurd
Director, Gold Coast Public Health Unit
July 2015

Summary

This report describes rates and trends for selected notifiable disease and immunisation in the Gold Coast Hospital and Health Service (GCHHS) region. It is the first report for communicable disease and immunisation in the GCHHS region.

Child vaccination coverage

For the 12-month period ending 31 December 2014, 90% vaccination coverage was achieved at the 12, 24 and 60 month milestones, with the exception of 89.9% at the 12 month milestone in quarter 2 and 87.6% at the 24 month milestone in quarter 4.

Indigenous vaccination coverage rates were relatively higher than the rest of the population at the 24 and 60 month milestones. Coverage of 90% was achieved in all quarters except for quarter 4, where 88.9% coverage was achieved at the 24 month milestone. Similar coverage was not observed at the 12 month milestone, fluctuating between 67.6% and 90.7% at the lowest and highest point.

School vaccination coverage

In 2014, school vaccination coverage rates varied between vaccine type and age group. Coverage rate for adolescent diphtheria, tetanus and pertussis was greater among year 8 students than year 10 students (76% compared to 68% respectively). A coverage rate of 62% was achieved for the varicella vaccine, of which was only administered to year 8 students. HPV vaccination rate for girls was the highest since inception of the program in 2007. Coverage of 77%, 74% and 62% was achieved at dose 1, 2 and 3, respectively.

Notifiable conditions

Between 2012 and 2014, there was an average of 6,438 notifications of communicable disease reported, per year, in the Gold Coast Hospital and Health Service region.

The greatest notification rate (per 100,000 population) was reported for chlamydia (417.3), followed by lab confirmed influenza (349.1), campylobacter (99.8), varicella (96.6) and salmonellosis (86.7). The relative risk of all five conditions in the Gold Coast was significantly lower than the rest of Queensland.

Introduction

The control of communicable diseases in the local community is predominantly the responsibility of public health physicians, public health nurses, environmental health officers and epidemiologists. This is coordinated by the Public Health Unit in collaboration with colleagues in hospitals, laboratories, community health centres, private medical practices, local government and other agencies, such as Gold Coast Primary Health Network.

This report provides the latest available overview of communicable disease notifications and trends for the Gold Coast Hospital and Health Service (GCHHS) region in comparison with the rest of Queensland. It is the first communicable disease report published for this specific area.

Subsequent chapters describe vaccination coverage, followed by disease specific trends over time and distributions by age and sex. Disease specific descriptions are structured under the categories of vaccine preventable disease, blood borne disease, gastro-intestinal disease, sexually transmitted disease, and miscellaneous other diseases.

Geographic area

Gold Coast Hospital and Health Service provides health care from the state boarder of New South Wales to the Coomera Region in Queensland. It comprises the Gold Coast City Council local government area and neighbouring Tamborine - Canungra 'Statistical Local Area' (SLA), which is part of the Scenic Rim Regional Council.

The region is surrounded by the Logan and Albert rivers in the north and northwest; Tamborine, Mount Tamborine, Canungra and Beechmont to the west; and Coolangatta in the south.

A map of the Gold Coast showing Local Government Areas (LGAs) within the Gold Coast Hospital and Health Service boundary is provided in appendix A.

Demography

The catchment population of the GCHHS region was estimated at 560,266 persons at 30 June 2014, with an average annual growth rate of 1.9% over five years and 2.5% over ten years. According to the 2011 Census, 6,350 persons (1.3%) of Gold Coast residents were Indigenous.

The Gold Coast is expected to demonstrate the largest population growth of any local government area in Queensland. By 2036, the resident population is projected to reach 922,267, an increase of 2.3% annually over 25 years. An annual increase of 1.8% over 25 years is projected for the rest of Queensland.

Gold Coast City is a key tourism destination. In addition to the resident population, approximately 4 million overnight tourists and 7.3 million day trippers visited the city in the year to 30 June 2011. On average, the city hosts more than 28,900 visitors every day.

Methodology

Immunisation coverage data were extracted from the Australian Childhood Immunisation Register (ACIR) for 12, 24 and 60 month milestones between 1 January 2013 and 31 December 2014 (two-year data).

Communicable disease notifications data were extracted from the Queensland Health Notifiable Conditions System (NOCS) database for all notifiable conditions for 2012 to 2014, and selected conditions of significance or other interest (for 2005 to 2014, 10 years data).

Rate ratios were calculated to compare GCHHS region with the rest of Queensland.

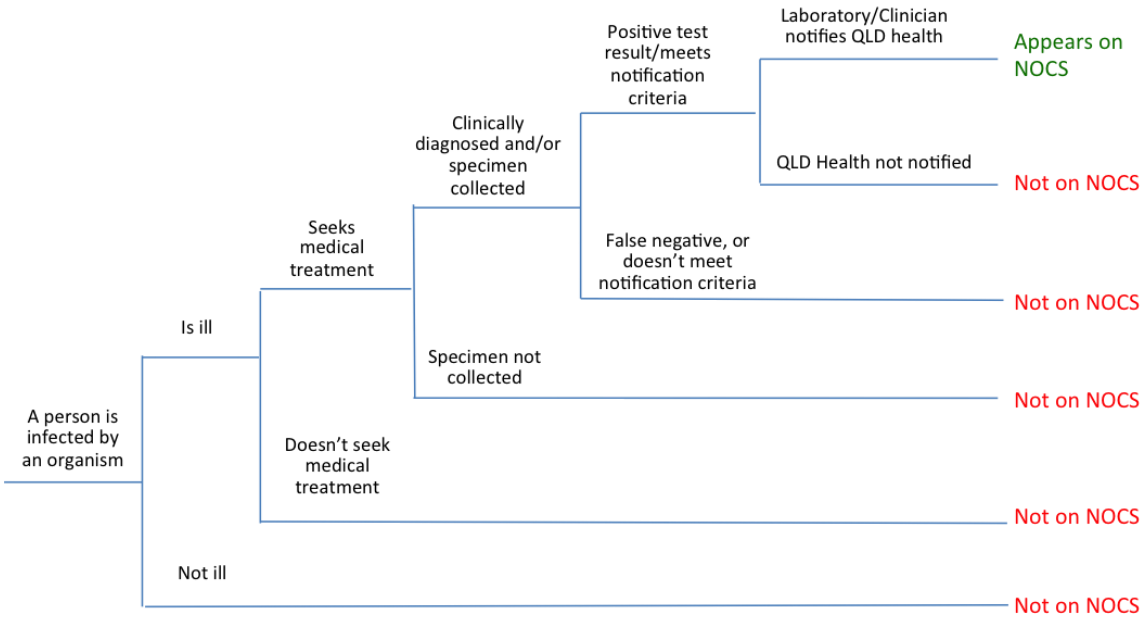
Data caveats

NOCS data is aggregated to 2006 Statistical Local Areas (SLAs). Therefore, NOCS data is a close approximation of actual notifications received. Most SLAs fit neatly into the HHS boundary, with the exception of Beaudesert – Part A. The majority of this SLA resides in Metro South Hospital and Health Service, and as such, no respective notifications are described within this report. A map of 2006 SLA boundaries and the Gold Coast Hospital and Health Service Boundary is provided in appendix B.

When interpreting NOCS data, it is important to consider a notification is assigned to a person's residential address rather than the geographic location of disease exposure.

Further, notifications may only represent a proportion of the total incidence. This is referred to as the 'notified fraction', and must be taken into account when interpreting data. Moreover, the notified fraction varies by disease and by time. 'Notifiable fraction' is demonstrated in figure 1.

Figure 1 Communicable Disease Notifiable Fraction



Notifications overview

Between 2012 and 2014, there was an average of 6,438 notifications of communicable disease reported, per year, in the Gold Coast Hospital and Health Service region.

Counts and rates for selected notifiable conditions in the Gold Coast and the rest of Queensland are presented in Table 1. In summary, the notification rate of 18 and 8 selected conditions were significantly lower or of no statistically significant difference to Queensland, respectively.

Notification rates of the following selected conditions were significantly lower in the Gold Coast compared to Queensland; influenza, pertussis, varicella, vaccine adverse events, hepatitis C, hepatitis B, campylobacter, Salmonella, rotavirus, cryptosporidiosis, chlamydia, gonorrhoea, Barmah forest virus, ross river virus, non-TB mycobacteria, pneumococcal, legionella and Q fever.

Gold Coast notifications rates for mumps, measles, rubella, hepatitis A, syphilis, dengue fever, potential rabies/lyssa virus exposure and meningococcal were not significantly different to Queensland.

Table 1 Counts and rates of selected notifiable conditions, Gold Coast Hospital and Health Service and Queensland 2012-14

Condition	Average Annual Notifications (2012-14)			
	No. of notifications (Rate per 100,000 pop)		Gold Coast HHS compared with Queensland	
	Gold Coast HHS	Queensland	Ratio (95% Confidence Interval)	Significant difference (GCHHS v QLD)[1]
Vaccine preventable disease				
Influenza (lab confirmed)	1,218 (349.1)	13,861 (389.0)	0.72 (0.68 - 0.76)	↓
Pertussis	363 (28.9)	4,249 (29.5)	0.70 (0.62 - 0.77)	↓
Varicella	491 (96.6)	5,438 (125.4)	0.74 (0.67 - 0.81)	↓
Vaccine adverse events	29 (8.6)	398 (10.8)	0.59 (0.40 - 0.85)	↓
Mumps	7 (1.2)	41 (1.0)	1.55 (0.69 - 3.49)	–
Measles	<5 (1.2)	44 (1.5)	0.67 (0.23 - 1.95)	–
Rubella	<5 (0.0)	5 (0.0)	1.72 (0.20 - 15.10)	–
Blood borne disease				
Hepatitis C	238 (41.2)	2469 (55.4)	0.79 (0.69 - 0.91)	↓
Hepatitis B	89 (19.1)	950 (22.3)	0.77 (0.62 - 0.96)	↓
Gastrointestinal disease				
Campylobacter	399 (99.8)	4,748 (131.9)	0.68 (0.62 - 0.76)	↓
Salmonellosis	357 (86.7)	3,916 (104.1)	0.81 (0.72 - 0.90)	↓
Rotavirus	92 (15.2)	1,015 (19.4)	0.74 (0.60 - 0.92)	↓
Cryptosporidiosis	75 (17.1)	935 (14.1)	0.65 (0.51 - 0.82)	↓
Hepatitis A	<5 (0.7)	41 (0.9)	0.58 (0.18 - 1.89)	–
Sexually transmitted disease				
Chlamydia	2,168 (417.3)	20,615 (436.5)	0.92 (0.88 - 0.96)	↓
Gonorrhoea	269 (55.9)	2,713 (57.6)	0.82 (0.72 - 0.93)	↓
Syphilis (infectious <2yr duration)	43 (11.6)	371 (8.3)	0.97 (0.71 - 1.34)	–
Arboviral disease				
Ross River Virus	131 (29.8)	2,029 (49.7)	0.51 (0.43 - 0.61)	↓
Barmah Forest Virus	71 (5.5)	1,226 (10.0)	0.45 (0.36 - 0.58)	↓
Dengue Fever	36 (6.6)	376 (8.3)	0.85 (0.61 - 1.19)	–
Other Disease				
Non-TB Mycobacteria	104 (23.4)	1,100 (29.1)	0.78 (0.63 - 0.95)	↓
Potential Rabies/Lyssa Virus exposure	75 (14.6)	585 (12.7)	1.09 (0.86 - 1.40)	–
Pneumococcal	23 (3.7)	283 (4.9)	0.66 (0.43 - 1.01)	↓
Legionella	9 (0.5)	111 (2.0)	0.65 (0.33 - 1.29)	↓
Q Fever	10 (2.0)	226 (5.1)	0.33 (0.17 - 0.63)	↓
Meningococcal	<5 (0.7)	46 (0.8)	0.65 (0.22 - 1.89)	–

Note 1. GC HHS to rest of QLD is based on relative risk, where
- ↓ GC HHS statistically significantly lower than QLD;
- ↑ GC HHS statistically significantly higher than QLD;
- – No statistically significant difference between GC HHS and QLD

Immunisation

Immunisation is a successful and cost effective public health intervention. It protects individuals and the community against harmful diseases by increasing the overall level of immunity and minimising the spread of infection.

The current National Immunisation Program (NIP) Schedule is summarised in appendix C. Vaccines under this schedule are funded by the Australian Government and are free of charge to children within eligible age groups. The NIP Schedule covers 16 diseases, including hepatitis B, diphtheria, tetanus, pertussis (whooping cough), haemophilus influenzae type b (Hib) disease, poliomyelitis, pneumococcal, rotavirus, measles, mumps, rubella, meningococcal C, varicella (chickenpox), hepatitis A, human papillomavirus (HPV) and influenza.

Population level immunity or 'herd immunity differs for each vaccine preventable disease. For example, measles requires vaccination coverage of 95% to reduce the incidence of infection in the population. Given high regional coverage rates tend to mask areas with low coverage rates, and the geographic clustering of vaccine hesitant groups in the population, the risk of disease outbreak remains, and sensible public health practice aims to achieve a coverage rate as close to 100% as possible.

The Gold Coast Public Health Unit (GCPHU) provides education, training and support to vaccine service providers in the Hospital and Health Service region. In addition, the GCPHU engages in intensive surveillance of children who have been identified by the Australian Childhood Immunisation Register (ACIR) as overdue for one or more vaccinations. The information derived from this surveillance is used to inform interventions to improve reported vaccination rates.

Child vaccination coverage

Achievement of the National Immunisation Program is measured by vaccination coverage, and is reported at 12, 24 and 60 month milestones (1, 2 and 5 years of age). Health authorities at the national, state and local level aim for vaccination coverage of at least 90%.

Vaccination coverage of 90% was achieved at all milestones in quarters 1 and 3 of 2014 (1 January – 31 March and 1 July – 30 September).

Ninety-percent coverage was not achieved at the 12 month milestone in quarters 2 and 4 (1 April – 30 June and 1 October – 31 December), and at the 24 month milestone in quarter 4.

Low coverage at the 24 month milestone in quarter 4 was potentially attributable to a change in criteria. As of 31 December 2014, the criteria for 'fully immunised' at 24 months was amended to also include dose 2 of measles, mumps and rubella (previously dose 1), dose 1 varicella and dose 1 meningococcal.

Table 2 Vaccination coverage by age cohort, Gold Coast Hospital and Health Service 01/01/2014 - 31/12/2014

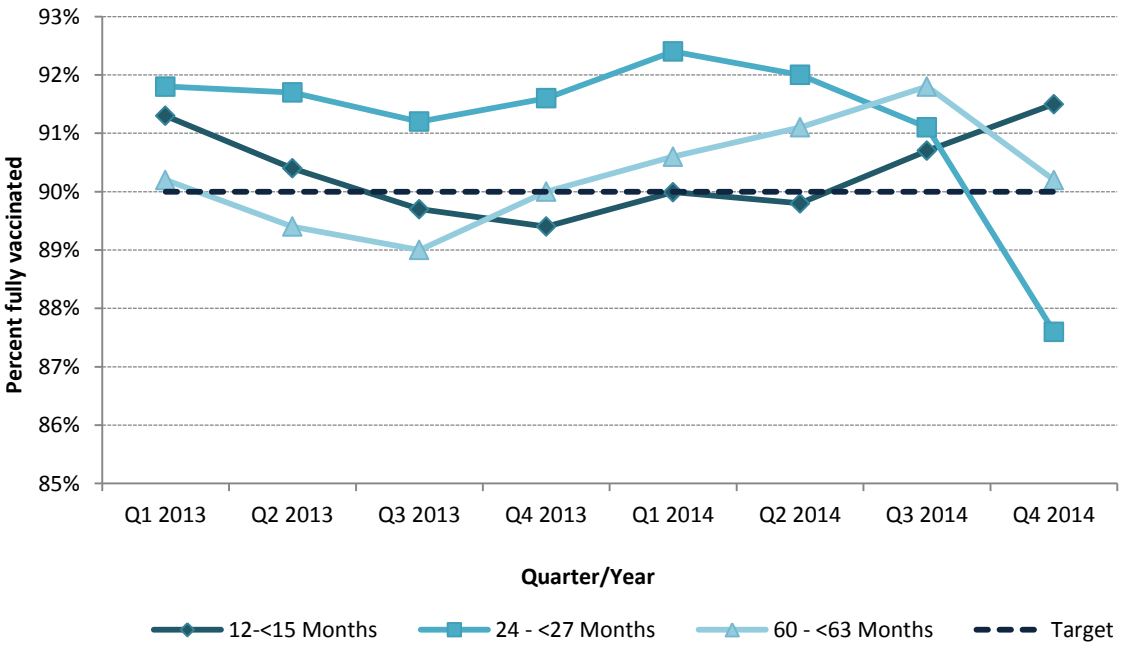
Cohort	Cohort					
	12- <15 Months		24- <27 Months		60- <63 Months	
	All	Indigenous	All	Indigenous	All	Indigenous
Q1 (2014)	90.0 (1686)	95.0 (40)	92.4 (1627)	95.7 (46)	90.6 (1743)	100.0 (39)
Q2 (2014)	89.9 (1682)	67.6 (34)	92.0 (1708)	94.1 (51)	91.1 (1696)	95.8 (48)
Q3 (2014)	90.7 (1761)	91.1 (37)	91.1 (1732)	95.7 (46)	91.8 (1789)	92.3 (39)
Q4 (2014)	91.5 (1671)	88.6 (35)	87.6 (1740)	88.9 (36)	90.2 (1803)	96.3 (54)

Between 1 January 2013 and 31 December 2014 (two years), vaccination coverage at the 12 month milestone fluctuated between 89.4% and 91.5% (figure 2). Vaccination coverage trended upward across the 2014 calendar year, and with the exception of quarter 2, remained above the 90% target.

Over the same two year period, vaccination coverage at the 24 month milestone fluctuated between 87.9% and 92.4%. Vaccination coverage maintained above 90% for all quarters with the exception of quarter 4 2014, when it decreased to 87.6%. A change to the 'fully immunised' criteria at 24 months is likely to be attributable for this decrease.

Vaccination coverage fluctuated between 89% and 91.8% at the 60 month milestone. Although since quarter 4 2013, vaccination coverage has remained above 90%.

Figure 2 Time series of vaccination coverage rates for all children by age cohort, Gold Coast Hospital and Health Service (two years: 01/01/2013 – 31/12/2014)



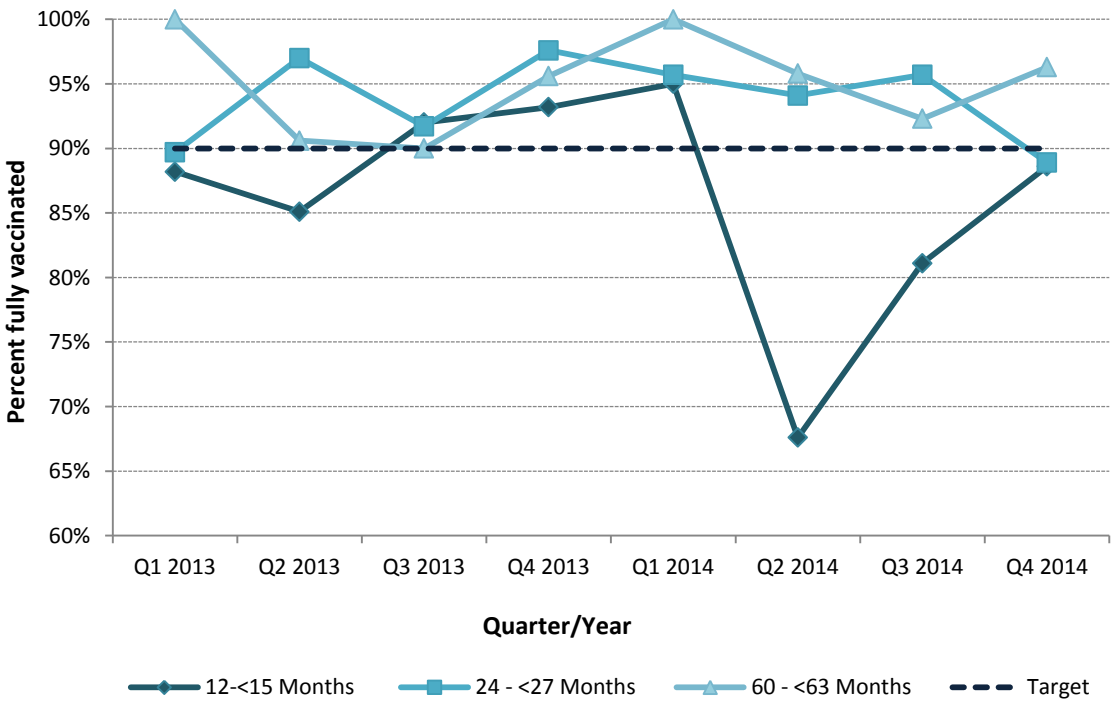
Ensuring high vaccination coverage for Aboriginal and Torres Strait Islander children is an important aspect of closing the gap in Indigenous health outcomes. In the Gold Coast, vaccination coverage among Indigenous children is often higher relative to the general population.

Between 1 January 2013 and 31 December 2014 (two years), vaccination coverage at the 12 month milestone varied considerably, ranging between 67.6% and 95% (figure 3). By quarter 4 2014, vaccination coverage increased to 88.6%, although this remained below the 90% target. Explanations for these fluctuations are currently being examined to understand factors that may have an impact on vaccination coverage in Indigenous communities.

Vaccination coverage at the 24 month milestone ranged between 88.9% and 97.6% over the same two-year period. With the exception of quarter 1 of 2013 and 2014, vaccination coverage remained above 90%, of which four quarters achieved vaccination coverage above 95%.

Vaccination coverage at the 60 month milestone remained above the 90% target between 1 January 2013 and 31 December 2014, of which three quarters achieved above 95% and two quarters achieved 100% vaccination coverage.

Figure 3 Time series of child vaccination coverage rates for Indigenous children by age cohort, Gold Coast Hospital and Health Service (two years: 01/01/2013 – 31/12/2014)



School vaccination coverage

The School Immunisation Project (SIP) is an important part of the National Immunisation Program, providing parents the opportunity for their children to be vaccinated, free of charge, at secondary school. These services are coordinated by the Gold Coast Public Health Unit and delivered by the City of Gold Coast (COGC) Immunisation Services.

The current SIP schedule is described in appendix C, and includes vaccines to protect adolescents against diphtheria-tetanus-pertussis (dTpa), varicella, and human papillomavirus (HPV). This amended schedule excludes hepatitis B and now offers dTpa to students in year 8 (in addition to year 10).

The following sections describe coverage rates (2014) and vaccination rates over time (2008-14). The former includes students who were previously vaccinated. These vaccinations were often administered in general practice or interstate. The later only includes students who were vaccinated by the COGC immunisation services within respective vaccination periods; for 2014 this was 1 January to 18 December 2014.

Coverage rate

The Gold Coast achieved coverage rates of 75%, 72%, and 59% among year 8 students for doses 1, 2 and 3 of HPV, respectively (table 3). This was greater than that reported for year 10 students (64%, 57%, and 42%, respectively) (table 4).

The coverage rate for adolescent diphtheria, tetanus and pertussis was greater among year 8 students than year 10 students (76% compared to 68%, respectively). Due to changes to the immunisation schedule, subsequent annual figures for dTpa coverage will be reported for year 8 students only as of 2016.

A coverage rate of 62% was achieved for the varicella vaccine, of which is only administered to year 8 students.

Table 3 Summary of year 8 consent form return and coverage rate, 2014

Vaccine Type	Total Cohort	Number of forms returned	'Yes' to vaccination	'No' to vaccination	Previously vaccinated	Number Vaccinated	Coverage Rate[1]
HPV 1	6583	5437	4974	463	35	4902	75%
HPV 2	6583	5437	4974	463	35	4698	72%
HPV 3	6583	5437	4974	463	35	3868	59%
dTpa	6583	5392	4993	399	103	4874	76%
V V	6583	5035	3496	1536	689	3414	62%

Table 4 Summary of year 10 consent form return and vaccination coverage, 2014 (HPV for male students only)

Vaccine Type	Total Cohort	Number of forms returned	'Yes' to vaccination	'No' to vaccination	Previously vaccinated	Number Vaccinated	Coverage Rate[1]
dTpa	6774	4810	4606	204	72	4514	68%
HPV 1	3512	2354	2238	116	27	2206	64%
HPV 2	3512	2354	2238	116	27	1981	57%
HPV 3	3512	2354	2238	116	27	1441	42%

Note 1: Coverage rate equates to those students previously vaccinated plus the number of students vaccinated in the SBVP of the total cohort.
Note 2: Data collection included school and catch-up clinics held until 18 December 2014.

Glossary:
HPV – Human Papillomavirus vaccine
V V – Varicella vaccine (Chickenpox)
dTpa – Diphtheria-tetanus-pertussis vaccine

Consent form return rate

Consent form return is the first step to commencing the vaccination process. In 2014, a consent form return rate of 85.2% was achieved, of which 78% responded 'yes' to vaccination (figure 4). This is the highest consent form return rate recorded for the Gold Coast since the initiation of the School Immunisation Project in 2007.

HPV Vaccination rate

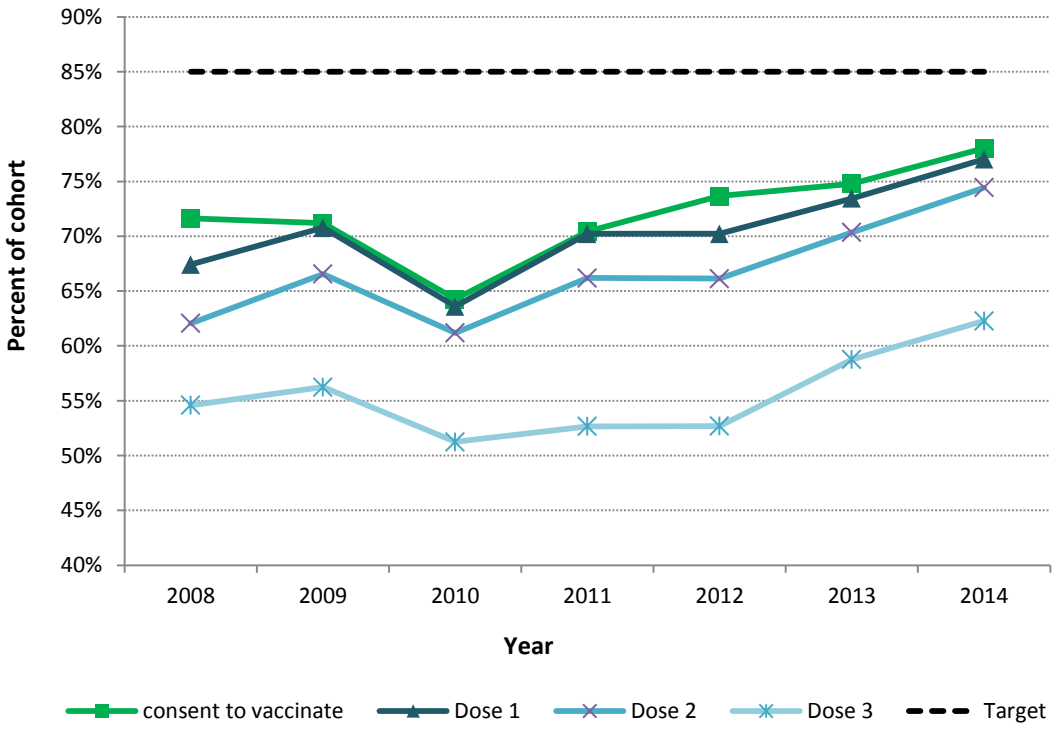
Figure 4 summarises HPV vaccination coverage, by dose, and consent form return rate in the Gold Coast. Due to a series of changes to vaccination cohorts between 2007 and 2013, including the introduction of the HPV vaccine to year 8 and 10 boys in 2013, figures are only reported for year 8 girls.

HPV vaccination coverage for year 8 girls for the Gold Coast at the end of December 2014 was the highest since inception of the program in 2007. Coverage of 77%, 74% and 62% was achieved at dose 1, 2 and 3, respectively. These figures are the product of a steady increase, across all doses, since 2010. Despite considerable improvements in vaccination coverage, Gold Coast is still under-performing relative to the national target of 85%.

In 2014, an attrition of 2.6% was observed between doses 1 and 2, and 12% between doses 2 and 3 of the HPV vaccination coverage. Since the inception of the program in 2007, attrition has decreased between doses 1 and 2 by 2.8%, although increased by 4.7% between doses 2 and 3.

Figures for adolescent vaccination rate presented in figure 4 only include those administered by the COGC immunisation service in schools and in the catch-up clinics up till February/March of the following year.

Figure 4 Time series of HPV vaccination rate, by dose, and consent form return for year 8 girls, Gold Coast Hospital and Health Service 2008-14



Note 1. Coverage rate equates to the number of children vaccinated in the School Immunisation Program plus the number of students previously vaccinated, of the total eligible cohort.
Note 2. Data includes vaccinations that were administered in schools and catch-up clinics until the 18 December 2014

Vaccine preventable disease

Pertussis

Pertussis (or whooping cough) is a highly contagious respiratory infection caused by the bacterium *Bordetella Pertussis*. Pertussis can affect people of any age, although for babies and young children, pertussis can be life threatening.

Immunisation is the most effective way to prevent pertussis, and is recommended as part of the NIP Schedule. The vaccine is funded for infants at age 2, 4 and 6 months, children aged 4 years, and year 8 and 10 students.

There were 162 notifications of pertussis in the Gold Coast in 2014. The notification rate of pertussis was 29 per 100,000 population, which was similar to Queensland (figure 5). Since 2009, the notification rate of pertussis in the Gold Coast has remained lower than Queensland, with the greatest difference recorded in 2009 (121 compared to 187 notifications per 100,000 population). Caution should be applied when comparing recent figures with historical data due to the introduction of a stricter case definition for pertussis in 2013.

The age and sex distribution of pertussis notifications for 2014 is shown is figure 6. The highest number of notifications was recorded for adolescents aged 10-19 years, followed by children aged 5-9 years (55 and 31 notifications, respectively). The lowest number of notifications was recorded for adults aged 30-39 years and 80 years and over (three or fewer notifications each). A greater number of notifications were recorded for female than male children 0-4 years of age, although the converse was observed in children aged 5-9 years (13 compared to 7 and 12 compared to 19, respectively).

Figure 5 Pertussis notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

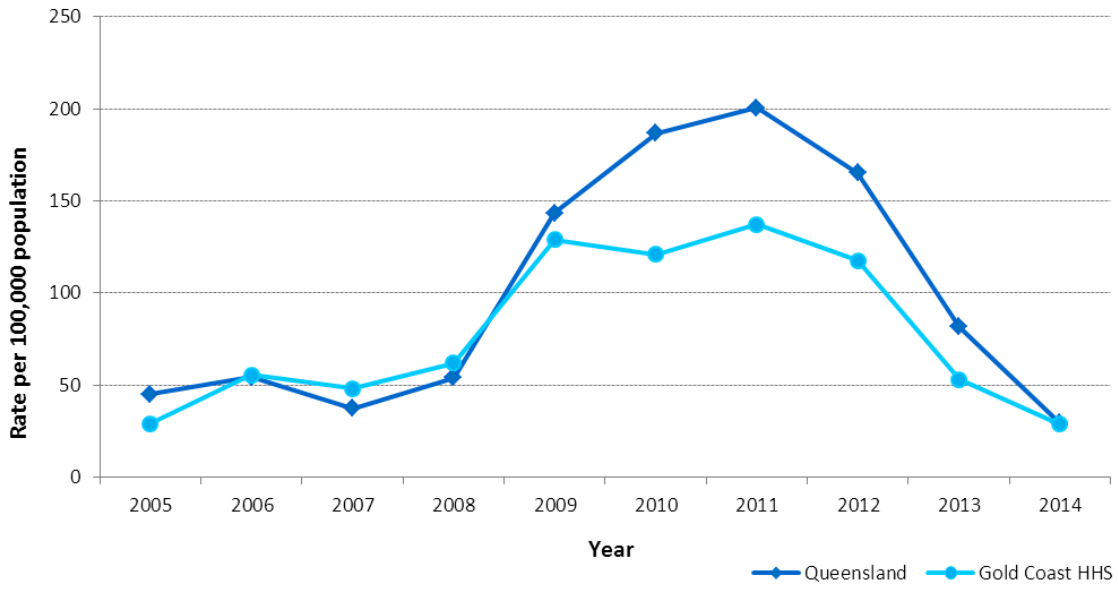
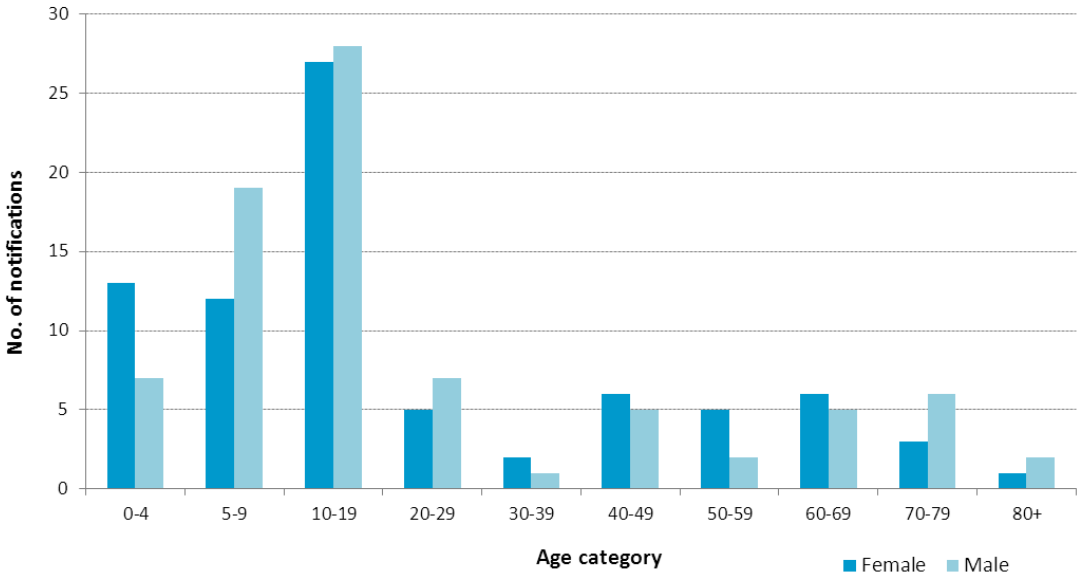


Figure 6 Age and sex distribution of pertussis notifications, Gold Coast Hospital and Health Service 2014



Measles

Measles is an acute and highly infectious illness caused by the measles virus. Measles can cause serious complications, such as pneumonia and encephalitis. Complications are more common and severe in people with chronic illness and very young children. Deaths occur mainly in children under five years of age.

Prevention of measles is achieved by immunisation, and is recommended as part of the NIP Schedule. The vaccine is available free for all children 12 and 18 months of age, and those born during or since 1966 who have not previously received two doses of measles containing vaccine.

There were seven notifications of measles in the Gold Coast in 2014. The notification rate of measles in the Gold Coast was 1.2 per 100,000 population, which was statistically similar to Queensland (1.5 per 100,000). Due to the small number of notifications in 2014, age and sex distribution is not described.

Mumps

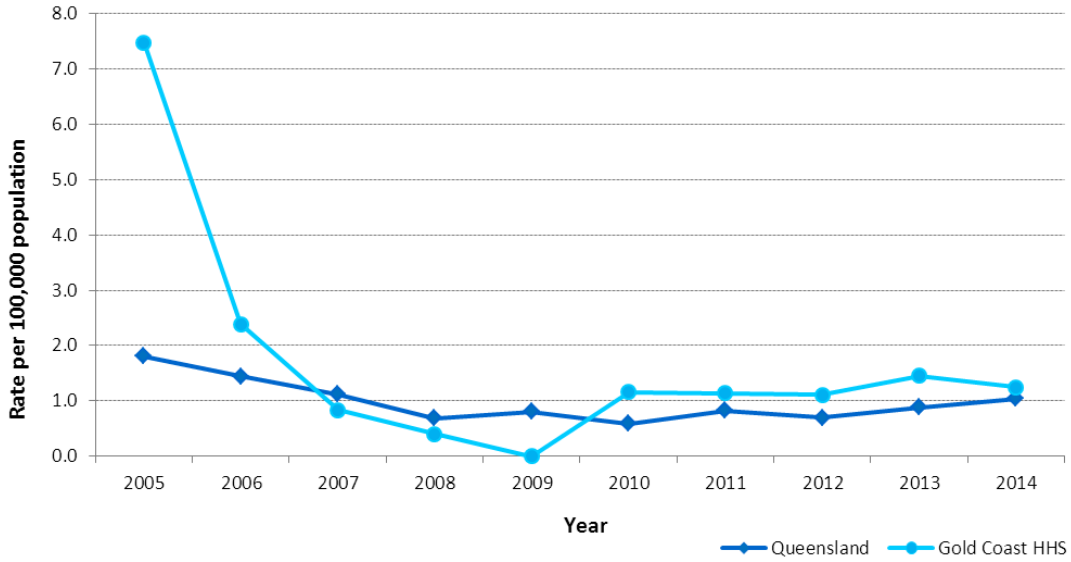
Mumps is an infection of the salivary glands caused by the mumps virus. The most common gland affected is the parotid gland, which causes swelling at the angle of the jaw in front of the ear. Occasionally, serious complications can occur, including hearing loss, sterility, and inflammation of the brain, spinal cord and pancreas.

Prevention of mumps is achieved by immunisation. The mumps vaccine is offered free of charge as part of the combined measles, mumps and rubella (MMR) vaccine. The NIP schedule recommends vaccination at 12 months and 18 months of age.

There were seven notifications of mumps in the Gold Coast in 2014. Since peaking at 7.5 notifications per 100,000 population in 2005, the annual notification rate of mumps has remained

extremely low (figure 7). Age and sex distribution is not described due to the small number of notifications in 2014.

Figure 7 Mumps notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014



Rubella

For most people, rubella (German measles) is a mild illness caused by the rubella virus. However, rubella can cause serious birth defects if infection occurs during pregnancy. Rubella occurs mainly in young unimmunised children, or adolescents who have received fewer than two doses of the vaccine.

Rubella can be prevented with vaccination, and is provided free of charge at 12 months and 18 months as part of the NIP schedule. Protection against rubella is offered in a combined measles, mumps and rubella vaccine.

Fewer than four notifications of rubella were recorded in the Gold Coast annually between 2005 and 2014, of which none were reported for 2014. Over this ten-year period, the annual notification rate of rubella remained below 0.6 per 100,000 population in both the Gold Coast and Queensland. For this reason, ten-year notification rate time series and age and sex distribution of rubella notifications is not described for 2014.

Varicella

Varicella (chicken pox) is a highly contagious disease caused by the varicella-zoster virus.

Immunisation is the best way to protect against varicella. The NIP schedule provides a combined measles, mumps, rubella and varicella vaccine free of charge to all children aged 18 months and a single dose varicella vaccine at 13 years of age. The adolescent dose of varicella will cease in 2017.

There were 541 notifications of varicella in the Gold Coast in 2014. This is the highest number of notifications since varicella became a notifiable condition in 2006. The notification rate of varicella in 2014 was 97 per 100,000 population, which was lower than Queensland (125 per 100,000 population) (figure 8).

Age and sex distribution of varicella is described in figure 9. The greatest number of notifications was recorded for adults aged 60-69 years, followed by adults 70-79 and 50-59 years of age (96, 80 and 78 notifications, respectively). These notifications are likely to be shingles rather than varicella, a reactivation of the latent infection associated with aging and immunosuppression. The least number of notifications was recorded for adults aged 80 years and over (39 notifications).

Differences were recorded in the number of notifications reported for males and females. The greatest disparity was observed in the 50-59 year age group, where the number of notifications for females was almost two-fold that of males (51 compared to 27, respectively).

Figure 8 Varicella notification rate by year, Gold Coast Hospital and Health Service and Queensland 2006 to 2014

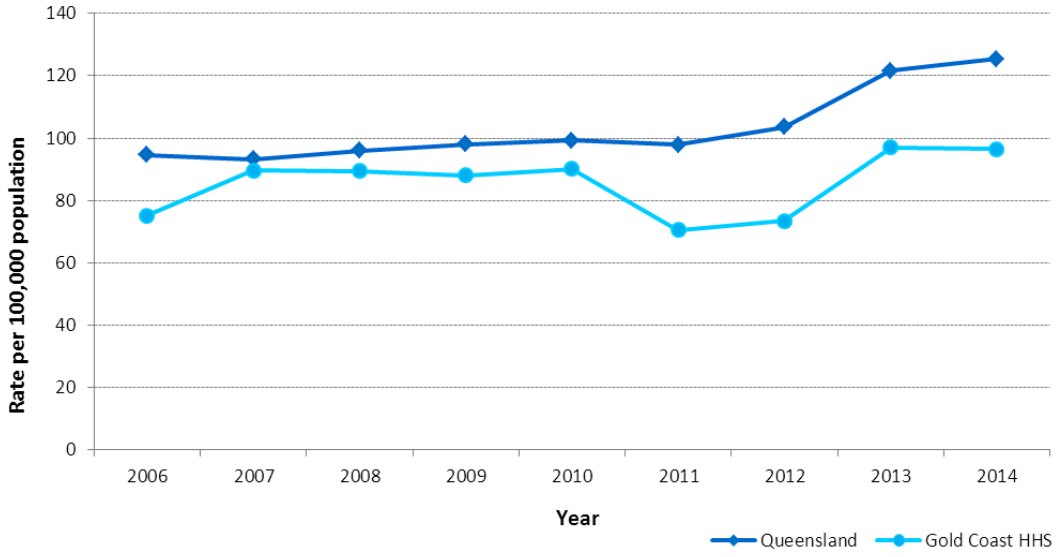
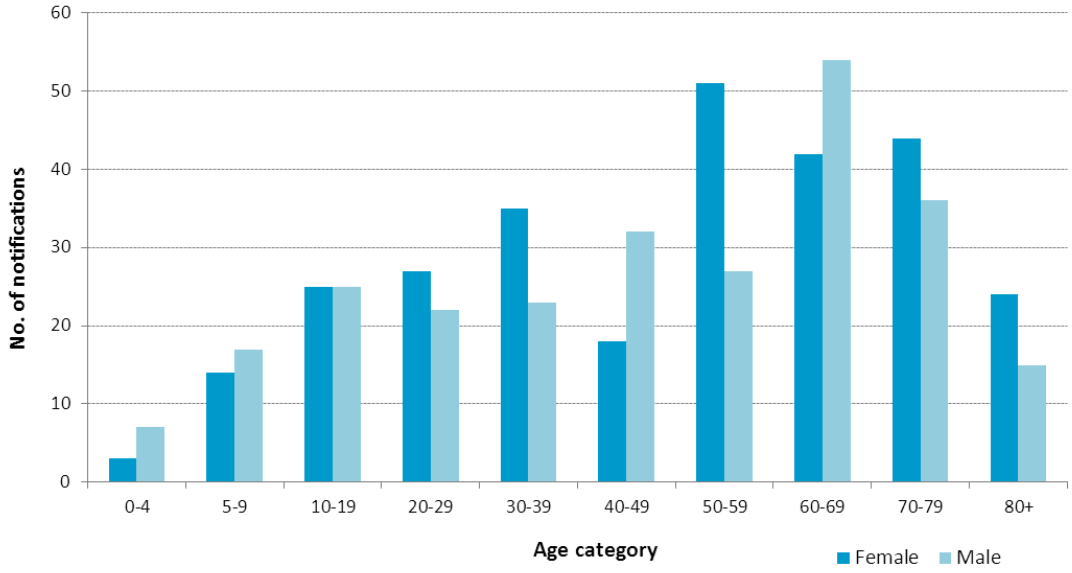


Figure 9 Age and sex distribution of varicella notifications, Gold Coast Hospital and Health Service 2014



Influenza (lab confirmed)

Influenza or 'the flu' is a highly contagious disease caused by infection from influenza type A or B (or rarely C) virus. These viruses infect the upper airways and lungs, but can also affect other parts of the body. In Australia, outbreaks of influenza of varying severity occur every year usually between May and September.

There were 1,956 notifications of influenza in 2014. The notification rate of influenza was 349 per 100,000 population, which was lower than Queensland as a whole (389 per 100,000) (figure 10). Over the ten-year period spanning 2005-14, considerable fluctuations were observed in the notification rate of influenza, ranging from 20 to 349 per 100,000 at the lowest and highest point, respectively. Annual notification rate of influenza in the Gold Coast has remained below Queensland over this time period.

Age and sex distribution of influenza notifications is described in figure 11. The highest number of notifications was observed for children 0-4 years of age (325 notifications). The lowest number of notifications was reported for adults over 80 years of age (98).

Overall, minor differences were observed between males and females across age groups. The greatest difference was observed between adults aged 20-29 years, where the number of influenza notifications for females was 1.5 times greater than males (114 compared to 45, respectively).

Figure 10 Lab confirmed influenza notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

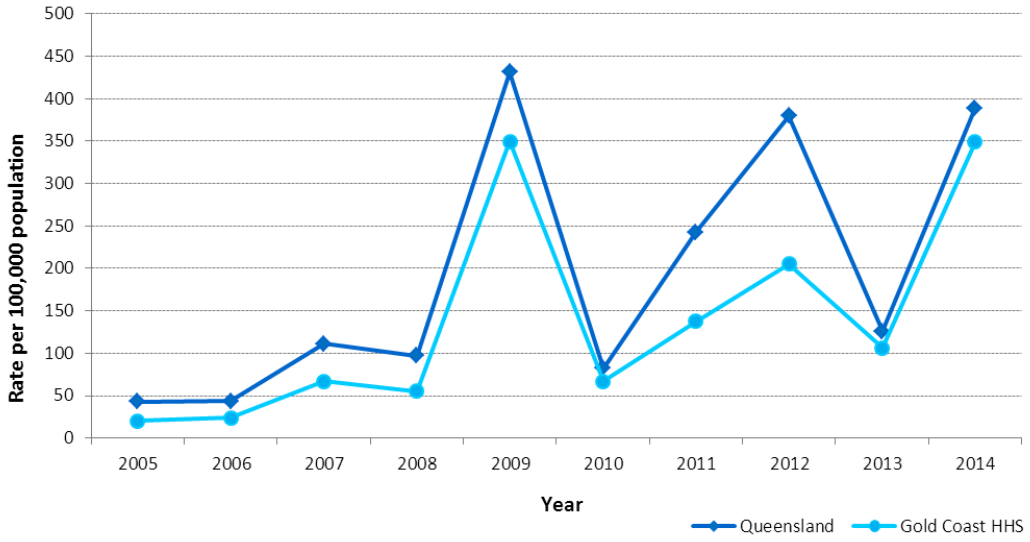
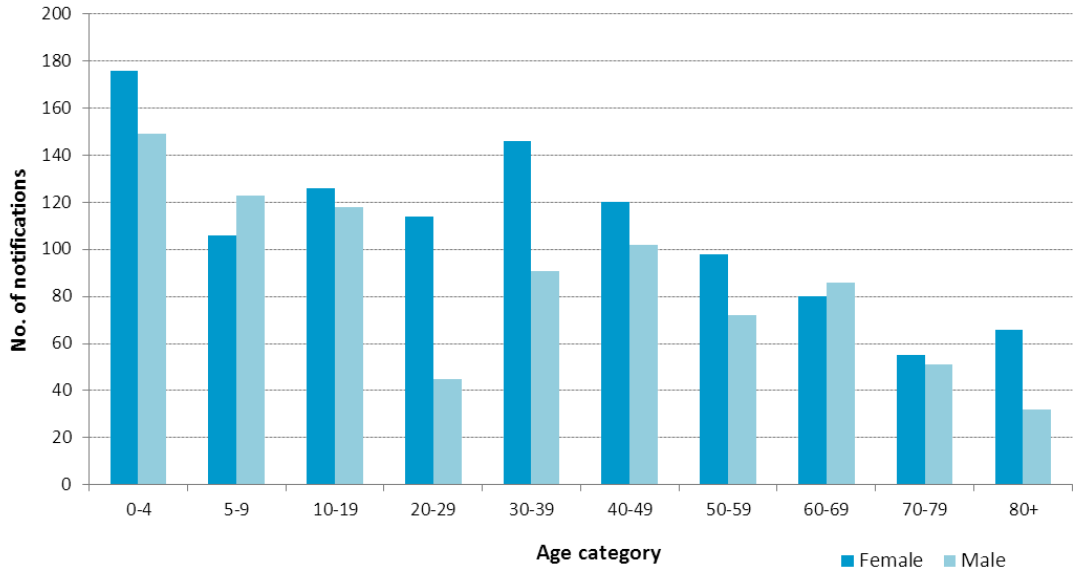


Figure 11 Age and sex distribution of lab confirmed influenza notifications, Gold Coast Hospital and Health Service 2014



Adverse events following vaccination

An adverse event is any unfavourable or unintended symptom, disease or sign associated with the use of a medicine or vaccine. The medicine of the vaccine does not necessarily have to have caused the adverse event.

There were 48 notifications of vaccination related adverse events in 2014. The notification rate of vaccine adverse events was 9 per 100,000, which was slightly lower than that reported for Queensland (11 per 100,000) (figure 12). A peak in annual notification rate was recorded in 2010, where 15 and 20 notifications per 100,000 were recorded in the Gold Coast and Queensland, respectively.

Almost two-thirds (63%) of all notifications of vaccination adverse events were reported for children 0-4 years of age, and 15% was recorded for adolescents 10-19 years of age (figure 13). More vaccination adverse events were notified for females than males in the 10-19 year age group. This age and sex distribution is likely to reflect the increased exposure to child and adolescent vaccination under the National Immunisation Schedule.

Figure 12 Notification rate of vaccination adverse events by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

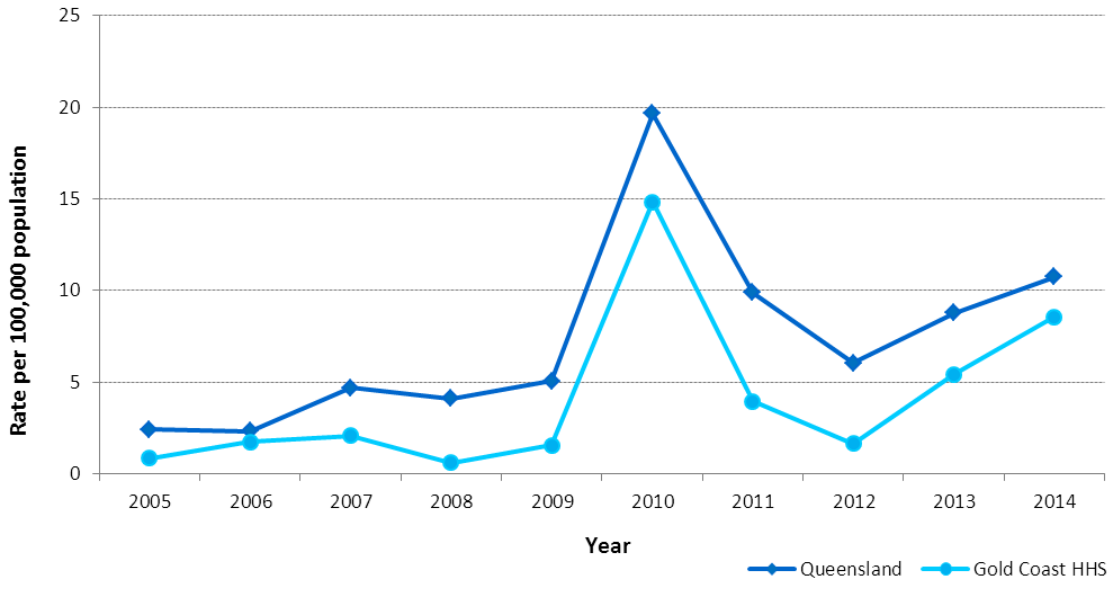
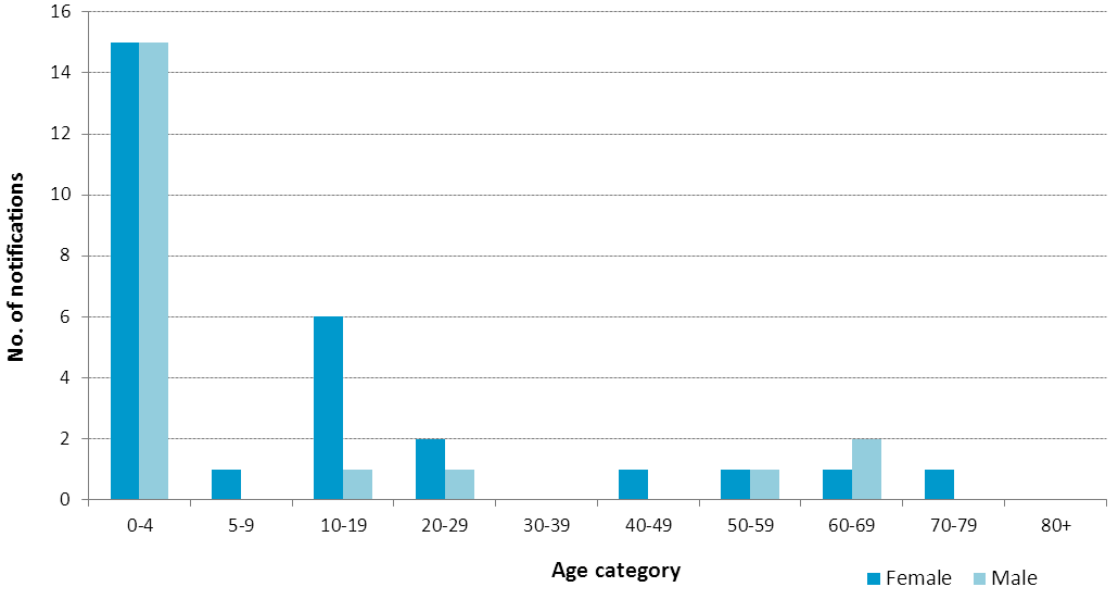


Figure 13 Age and sex distribution of notifications for vaccination adverse reactions, Gold Coast Hospital and Health Service 2014



Blood Borne Disease

Hepatitis B

Hepatitis B is an infection caused by the hepatitis b virus, which causes inflammation of the liver. Hepatitis B is one of the most serious types of hepatitis. The virus can cause either acute or chronic liver disease (including liver cancer). The disease can affect babies, children and adults.

Prevention of hepatitis B is achieved by immunisation, and is offered under the NIP schedule, free of charge, to children at birth, 6 weeks, 4 and 6 months of age; year 8 students; and various at risk groups, including close contacts of people with acute or chronic hepatitis B.

There were 107 notifications of hepatitis B in 2014. The notification rate of hepatitis B was 19.1 per 100,000 population, which was lower than that reported for Queensland (22.3 per 100,000) (figure 14). Over the previous ten years, the notification rate of hepatitis B in the Gold Coast has remained below Queensland, and ranged between 14.1 and 19.4 per 100,000 at the lowest at highest point.

The age and sex distribution of hepatitis B notifications is described in figure 15. Over 90 percent of hepatitis B notifications were for adults 20-59 years of age. No notifications were recorded for adults 80 years and older. Minor differences were observed between males and females, the greatest of which was recorded for adults 50-59 years of age (17 and 4 notifications, respectively).

Figure 14 Hepatitis B notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

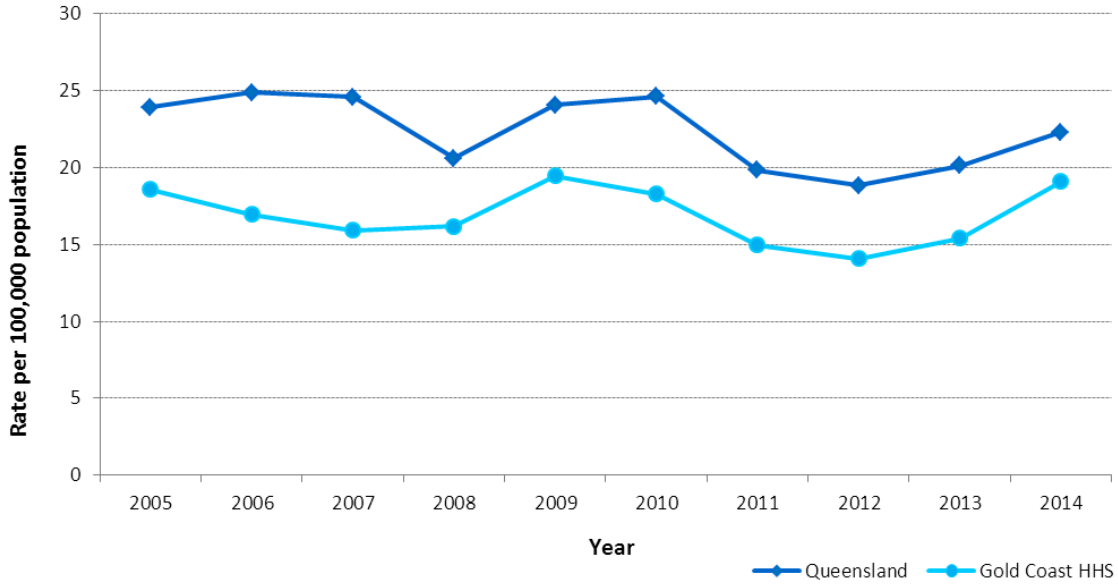
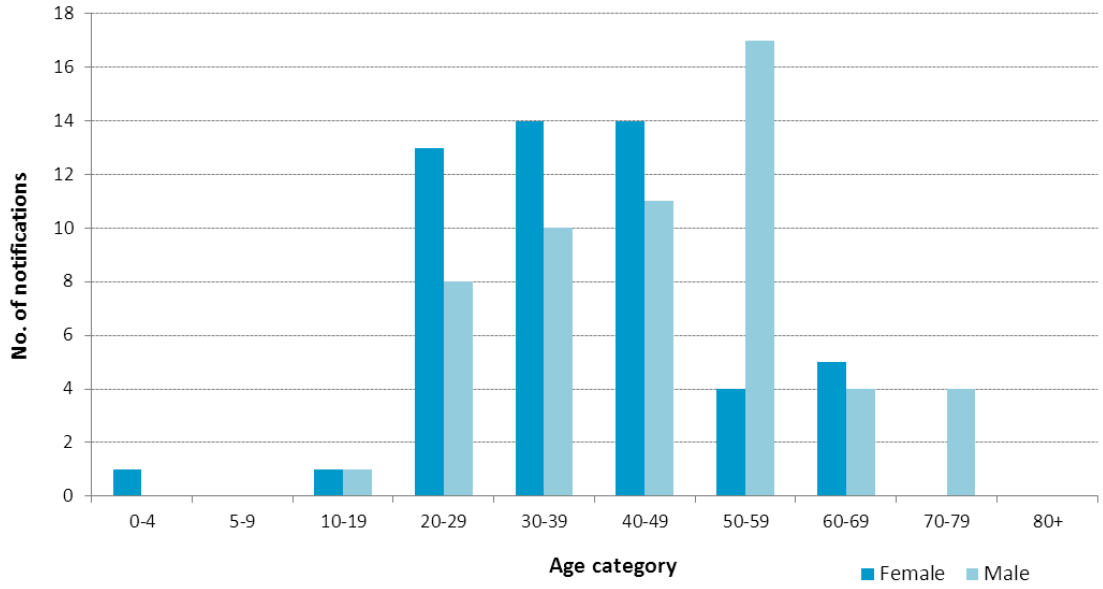


Figure 15 Age and sex distribution of Hepatitis B notifications, Gold Coast Hospital and Health Service 2014



Hepatitis C

Hepatitis C is a disease or inflammation of the liver, and is caused by the hepatitis C virus. Most people who are infected with hepatitis C will go on to have chronic (long term) hepatitis C.

There were 231 notifications of hepatitis C in 2014. The notification rate of hepatitis C was 41.2 per 100,000 population in the Gold Coast, compared to 55.4 per 100,000 in Queensland (figure 16). During the ten-year period spanning 2005 to 2014, an overall downward trend was observed in the notification rate of hepatitis C in both populations.

No notifications were recorded for children under the age of ten or adults 80 years of age and older (figure 17). Approximately 75% of all hepatitis C notifications were recorded for adults aged 30-59 years. Overall, a greater number of notifications were recorded for males than females. The greatest disparity was measured among adults aged 50-59 years, where the number of notifications of hepatitis C for males was almost twice the number recorded for females (42 compared to 24, respectively).

Figure 16 Hepatitis C notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

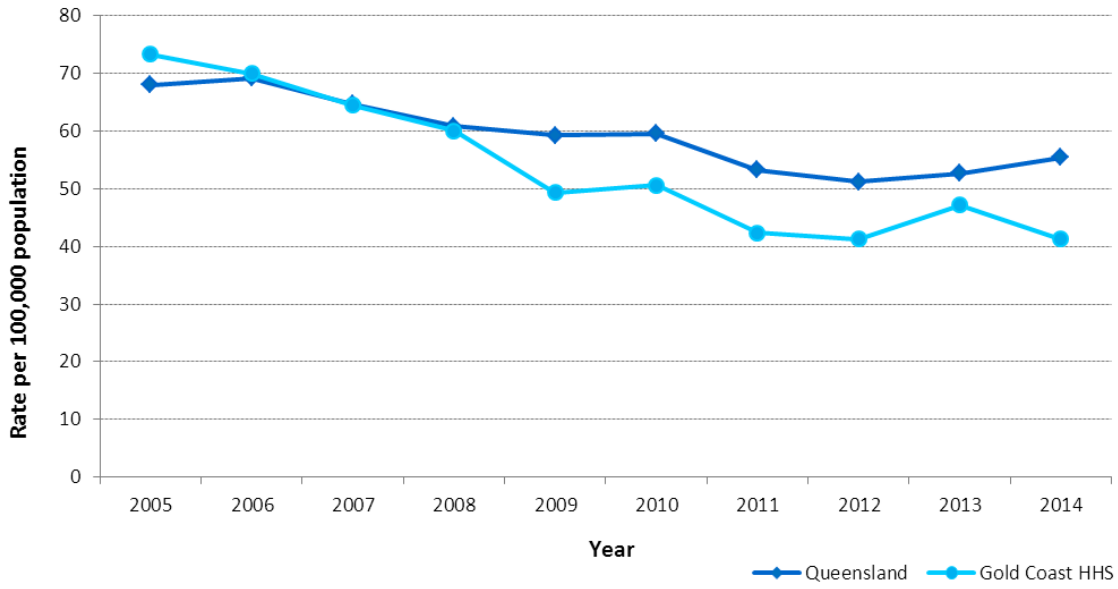
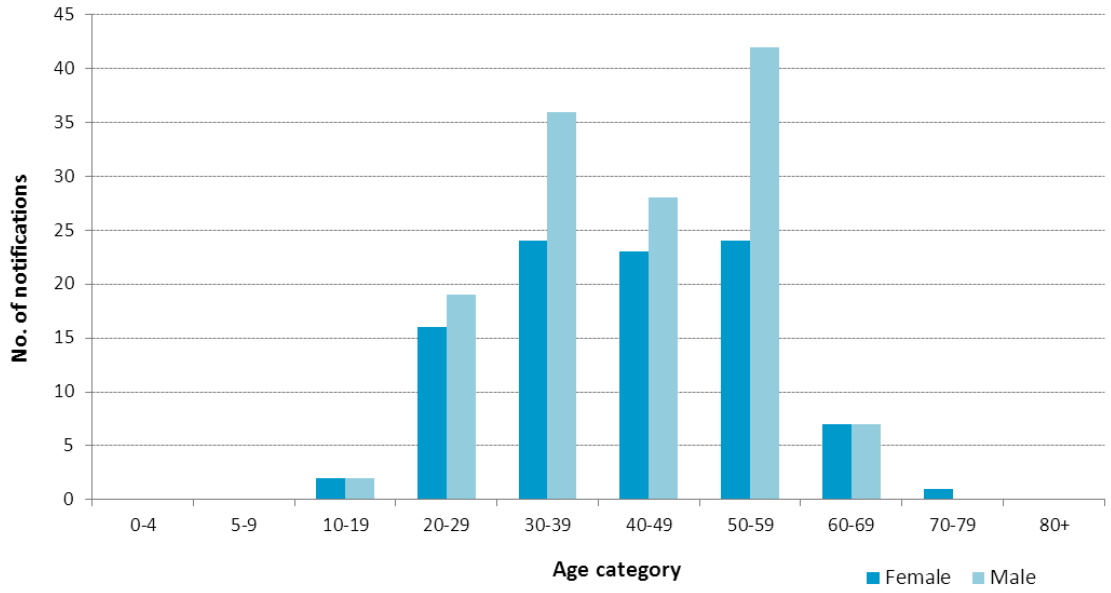


Figure 17 Age and sex distribution of hepatitis C notifications, Gold Coast Hospital and Health Service 2014



Gastrointestinal Disease

Campylobacter

Campylobacter infection is an infection of the digestive tract, caused by the bacteria *Campylobacter*. Campylobacter can affect all age groups, but is most common in children under five years of age and young adults.

There were 559 notifications of campylobacter in 2014. The notification rate of campylobacter was 99.8 per 100,000 population, which was lower than that in Queensland (131.9 per 100,000), a trend sustained since 2010 (figure 18). Prior to this, the Gold Coast reported an annual average of 15 notifications fewer per 100,000 than Queensland.

The distribution of campylobacter notifications was relatively even across age groups (figure 19). However, differences were observed between males and females. The greatest disparity was observed in the 10-19 year age group, where the number of male notifications was over two times that reported for females (40 and 19 notifications, respectively).

Figure 18 Campylobacter notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

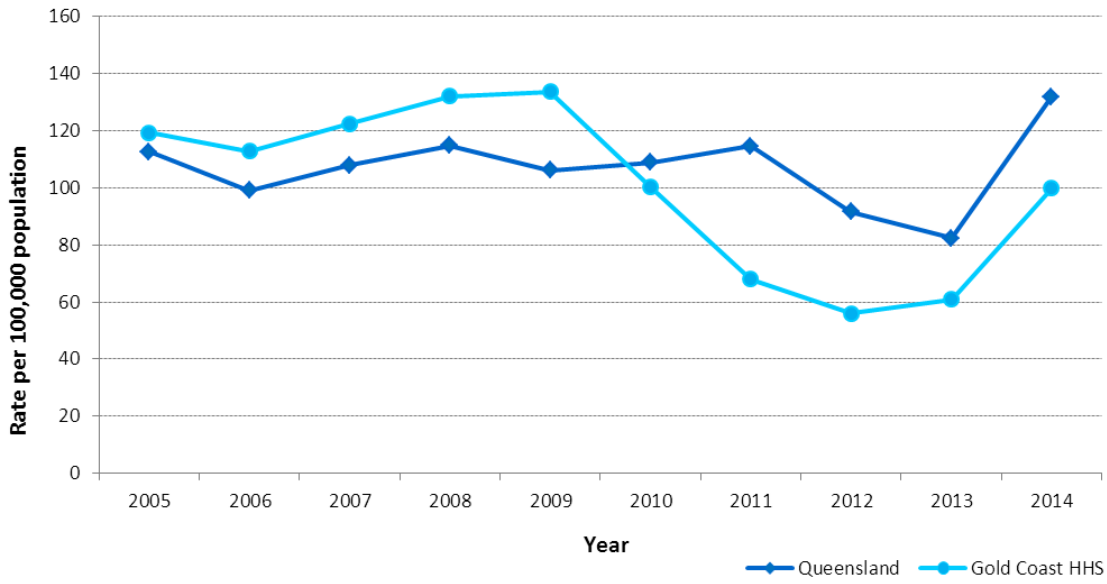
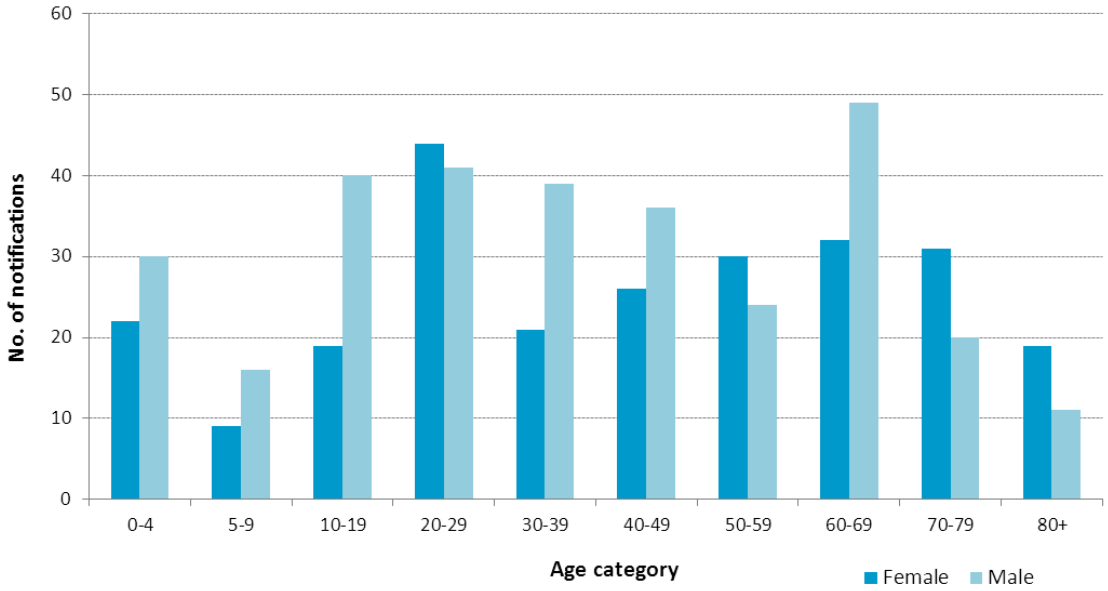


Figure 19 Age and sex distribution of campylobacter notifications, Gold Coast Hospital and Health Service 2014



Cryptosporidiosis

Cryptosporidiosis is an intestinal infection caused by the *Cryptosporidium Parvum*, a microscopic parasite. Parasites are often ingested via contaminated food and water, or more commonly, from person to person or animal to person. The disease is often mild, although can be serious for people with weakened immune systems.

There were 96 notifications of cryptosporidiosis in 2014. The notification rate of cryptosporidiosis was 17.1 per 100,000 population, which was higher than Queensland (14.1 per 100,000). Prior to 2014, the annual notification rate of cryptosporidiosis in the Gold Coast was generally lower than Queensland (figure 20).

Notifications for cryptosporidiosis were unevenly distributed across age groups (figure 21). Forty-nine percent of all notifications were for children under the age of 10 years. Overall, minor differences were observed between males and females. The greatest disparity was observed in adults 30-39 years of age, where the number of notifications was 3.5 times greater for males than females (14 compared to 4, respectively).

Figure 20 Cryptosporidiosis notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

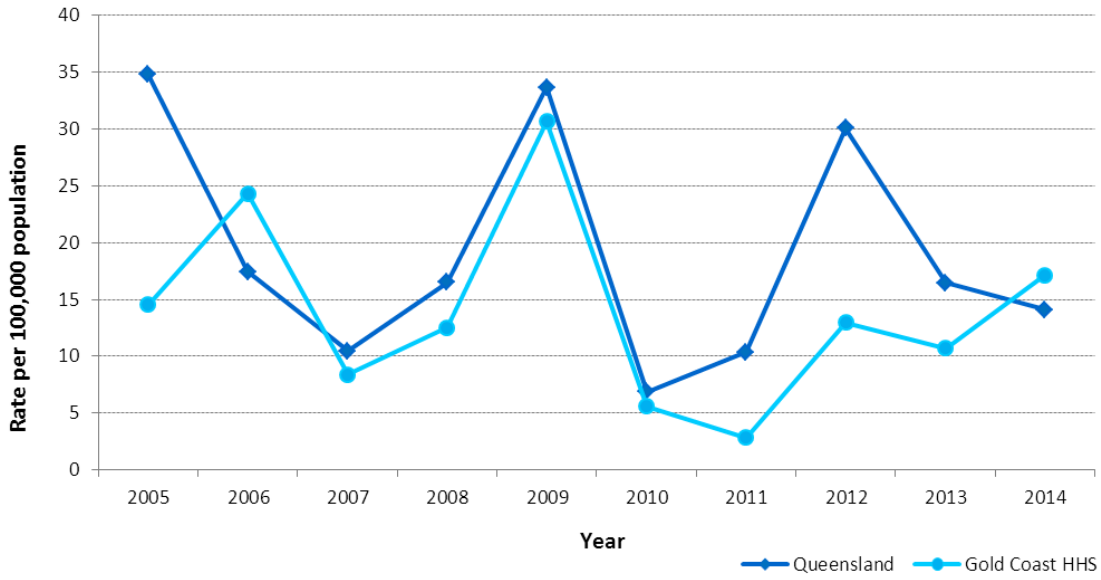
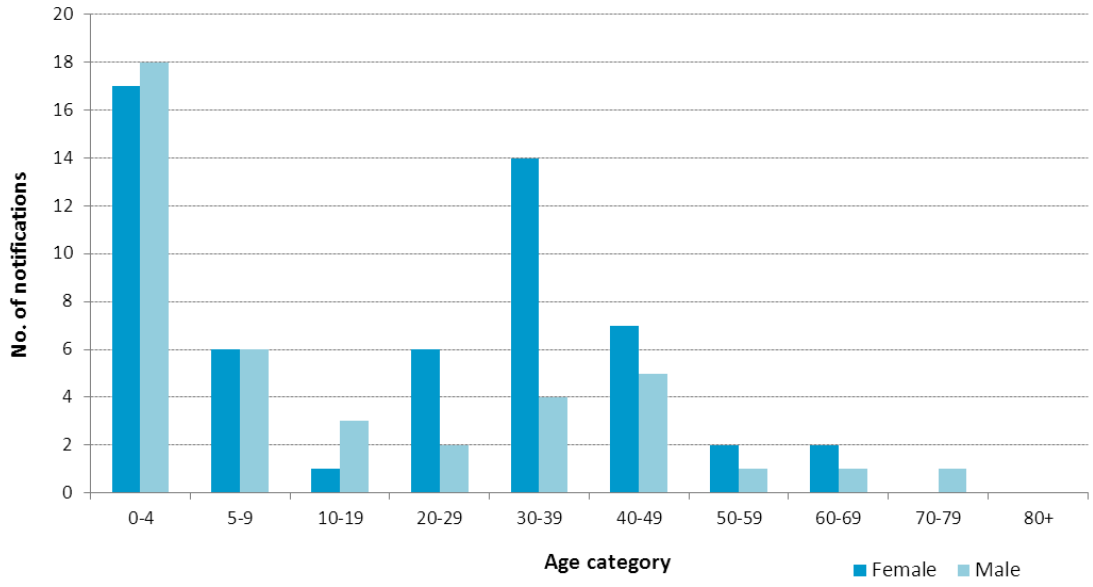


Figure 21 Age and sex distribution of cryptosporidiosis notifications, Gold Coast Hospital and Health Service 2014

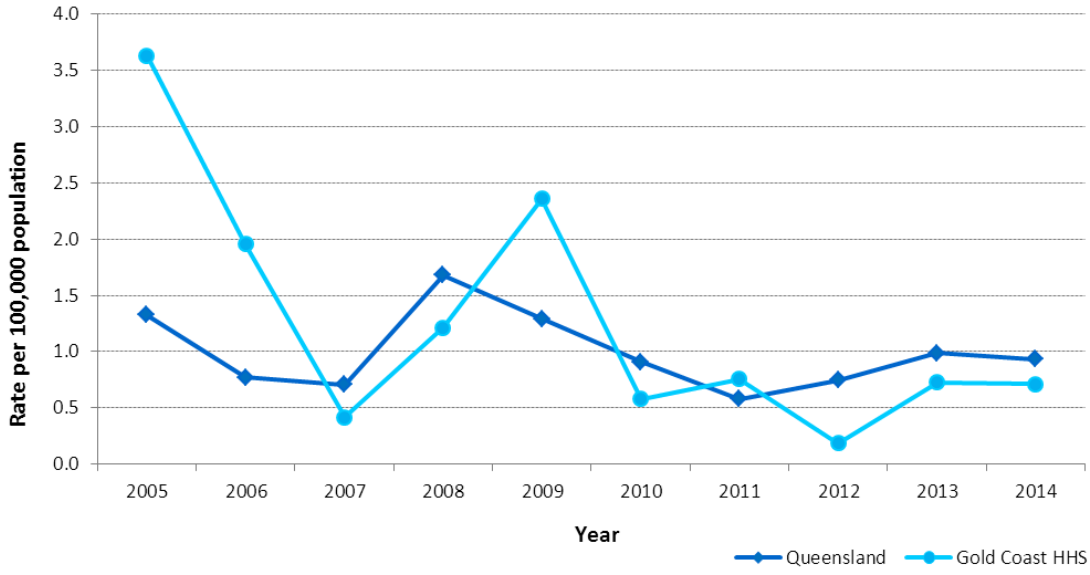


Hepatitis A

Hepatitis A, or infectious hepatitis, is an acute infection of the liver caused by the hepatitis A virus. It is spread by direct contact with items that have been handled and contaminated with faeces from an infected person.

There were 4 notifications of hepatitis A in 2014. The notification rate of hepatitis A was 0.7 per 100,000 population, which was statistically similar to Queensland (0.9 per 100,000). This is the product of an overall decrease in hepatitis A notifications in both populations over a ten year period (figure 22).

Figure 22 Hepatitis A notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014



Rotavirus

Rotaviruses are a group of viruses that can cause severe viral gastroenteritis in infants and young children. The virus is highly contagious and can cause outbreaks among children in childcare. Prevention of rotavirus is achieved by immunisation, and provided under the NIP schedule, free of charge, to infants at 2, 4 and 6 months of age.

There were 85 notifications of rotavirus in 2014. The notification rate of rotavirus was 15.2 per 100,000 population, was was slightly lower than Queensland (19.4 per 100,000) (figure 23). The notification rate of rotavirus in the Gold Coast has remained below Queensland for the previous nine years.

Rotavirus notifications were unevenly distributed across age groups, with over 50% of all notifications recorded for children under the age of 10 years (figure 24). In this age group, the number of rotavirus notifications for males was over two-times greater than females (31 compared to 15, respectively).

Figure 23 Rotavirus notification rate by year, Gold Coast Hospital and Health Service and Queensland 2006 to 2014

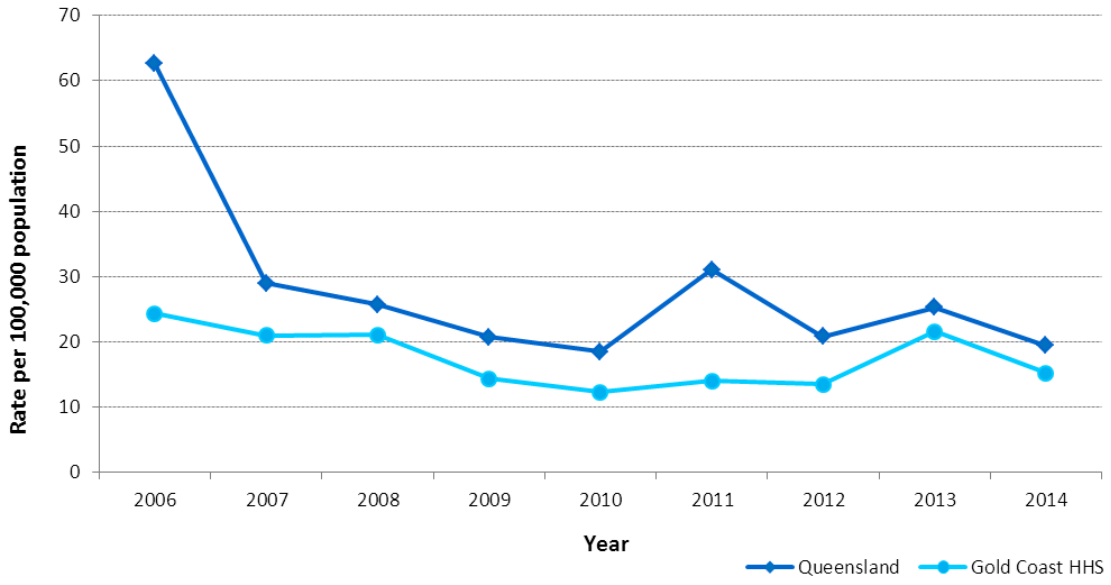
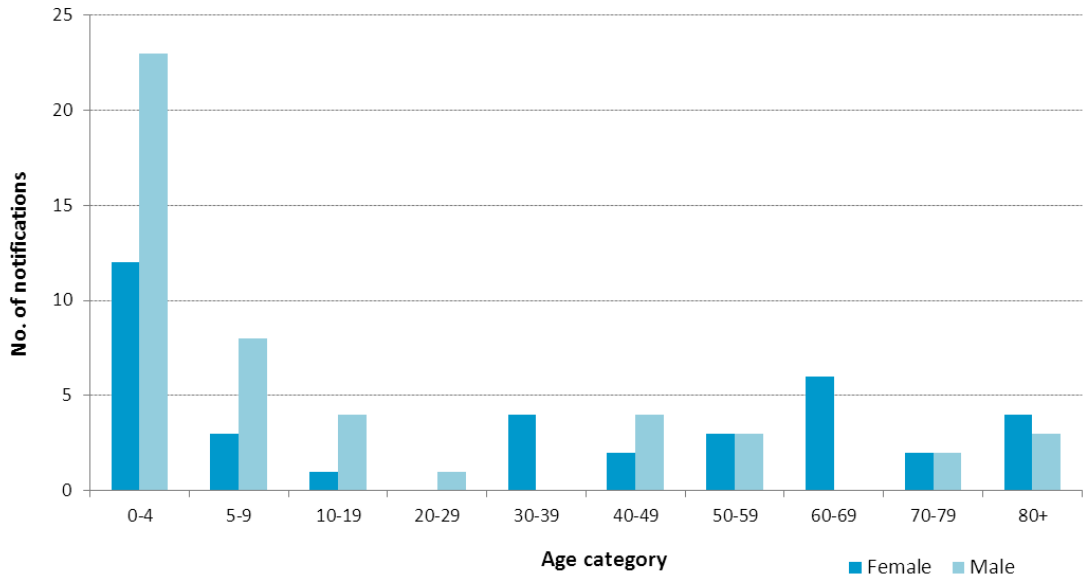


Figure 24 Age and sex distribution of rotavirus notifications, Gold Coast Hospital and Health Service 2014



Salmonellosis

Salmonellosis is a type of gastroenteritis caused by the Salmonella bacteria. Salmonellosis can affect all ages; however most cases occur in children and young adults.

There were 486 notifications of salmonellosis in 2014. The notification rate of salmonellosis was 86.7 per 100,000 population, which was lower than Queensland (104.1 per 100,000) (figure 25). The notification rate of salmonellosis has trended upward in both populations since 2009, demonstrating a 50% increase between 2013-14.

An uneven distribution of salmonellosis notifications was observed across age groups, where almost one-third of notifications were for children under the age of 10 years (figure 26). No considerable differences were observed in the number of notifications between males and females.

Figure 25 Salmonellosis notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

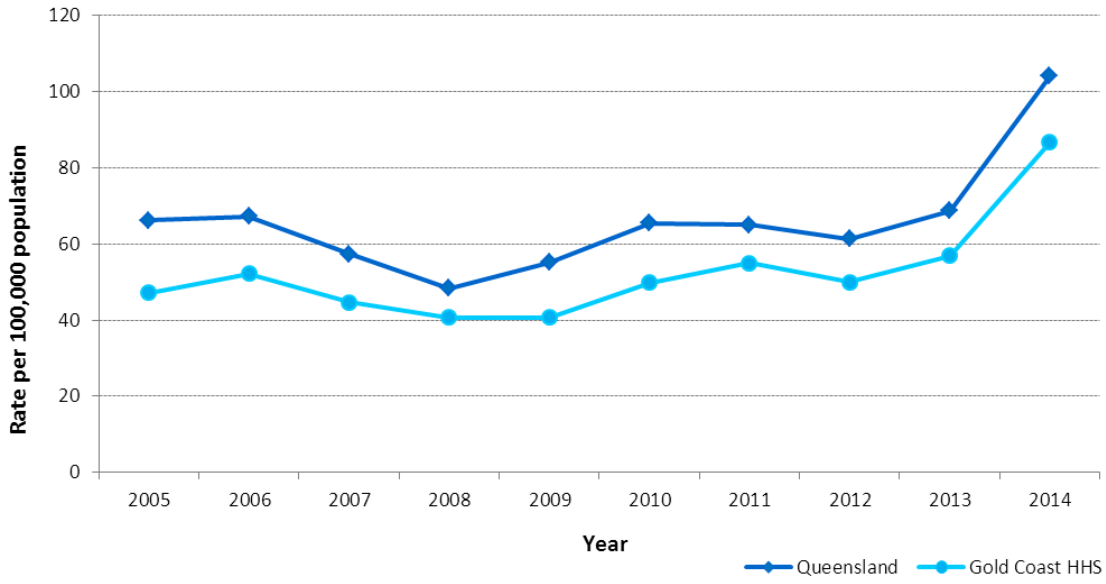
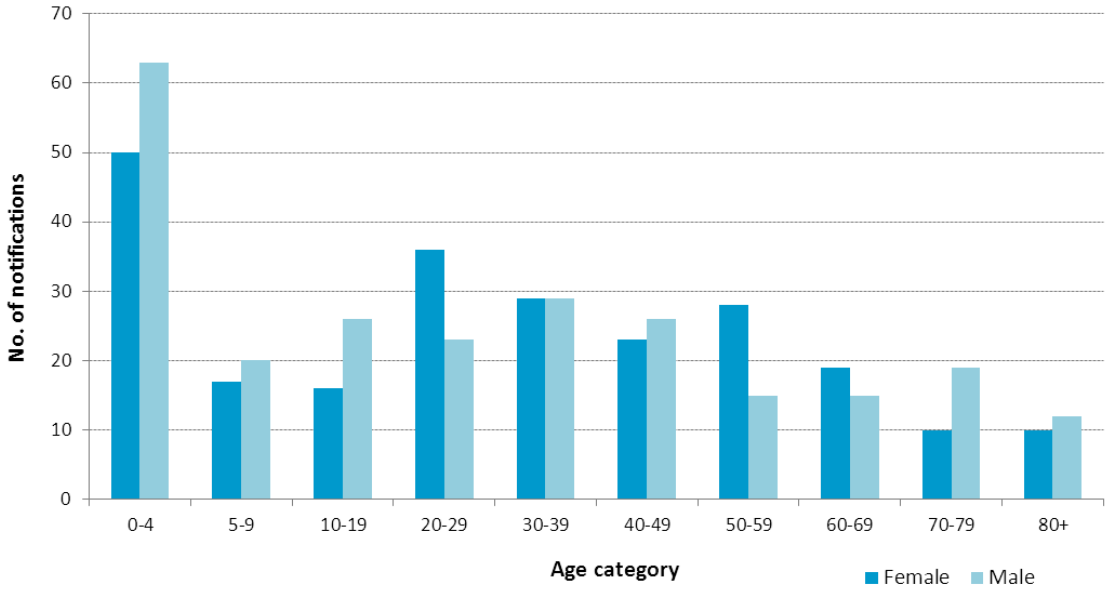


Figure 26 Age and sex distribution of salmonellosis, Gold Coast Hospital and Health Service 2014



Sexually Transmitted Disease

Chlamydia

Chlamydia is a common sexually transmitted infection (STI), caused by the Chlamydia Trachomatis bacteria. It is the most common bacterial STI worldwide and most commonly notified condition in Queensland

There were 2,334 notifications of chlamydia in 2014. The notification rate of chlamydia was 417.3 per 100,000 population, which was lower than Queensland (436.5 per 100,000) (figure 27). This is the result of an overall upward trend in both populations over a ten year period.

Notifications for chlamydia were not evenly distributed across age and sex groups (figure 28). Seventy-seven percent of all notifications were among adolescents aged 10-19 and adults aged 20-29 years. Considerably more notifications were recorded for females than males among the 10-19 and 20-29 year age groups (358 compared to 113 and 763 compared to 575, respectively).

Approximately 2% of notifications were for adolescents less than 16 years of age. Where appropriate, referrals to the Department of Communities, Child Safety and Disability Services were made.

Figure 27 Chlamydia notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

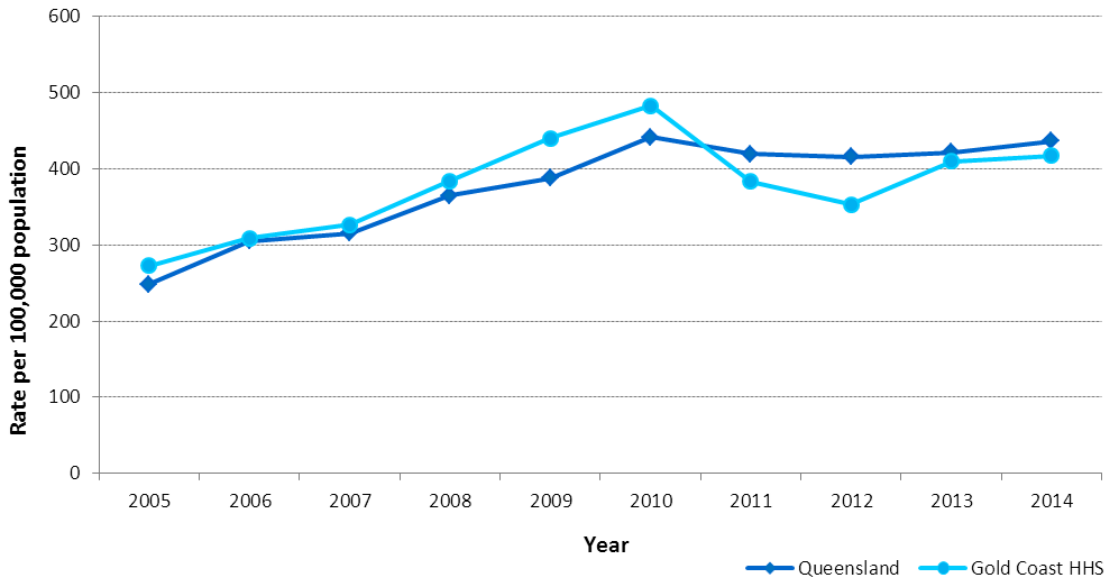
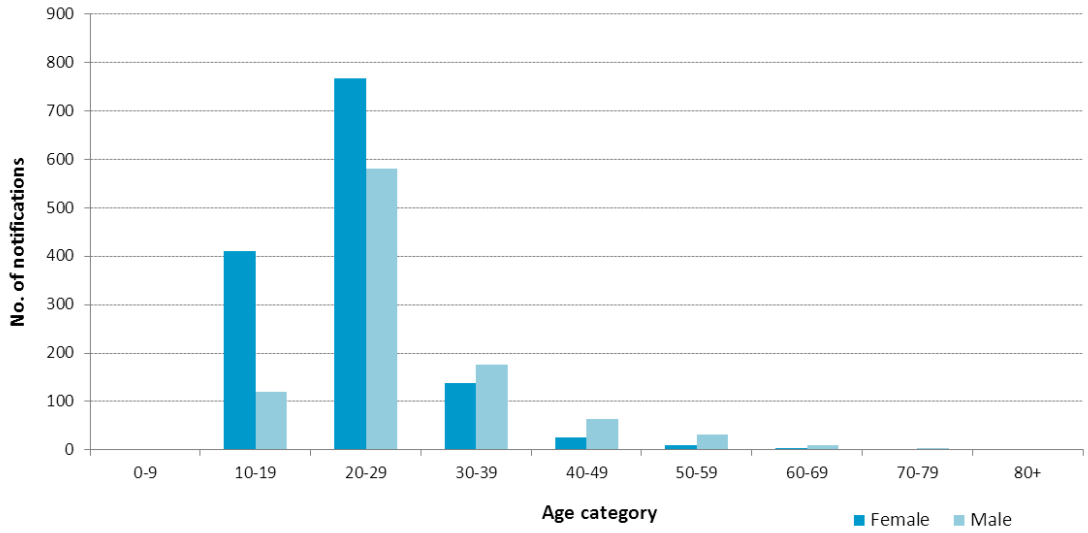


Figure 28 Age and sex distribution of chlamydia notifications, Gold Coast Hospital and Health Service 2014



Gonorrhoea

Gonorrhoea is a sexually transmitted infection caused by the bacterium *Neisseria gonorrhoea*. In Australia, it is most commonly diagnosed in men who have sex with men, among Aboriginal and Torres Strait Islander people living in remote areas, and in travellers returning from high prevalence areas overseas.

There were 313 notifications of gonorrhoea in 2014. The notification rate of gonorrhoea was 55.9 per 100,000, which was marginally lower than Queensland (57.6 per 100,000) (figure 29). Over the ten year period spanning 2005 to 2014, the annual notification rate of gonorrhoea trended upward in both populations.

Approximately 60% of gonorrhoea notifications were among adolescents and adults aged 10-29 years. Less than one percent of notifications were for adolescents younger than 16 years of age. Where appropriate, referrals to the Department of Communities, Child Safety and Disability Services were made.

A greater number of notifications were recorded for males across all age groups, where notifications for males were up to six times greater than females (figure 30).

Figure 29 Gonorrhoea notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

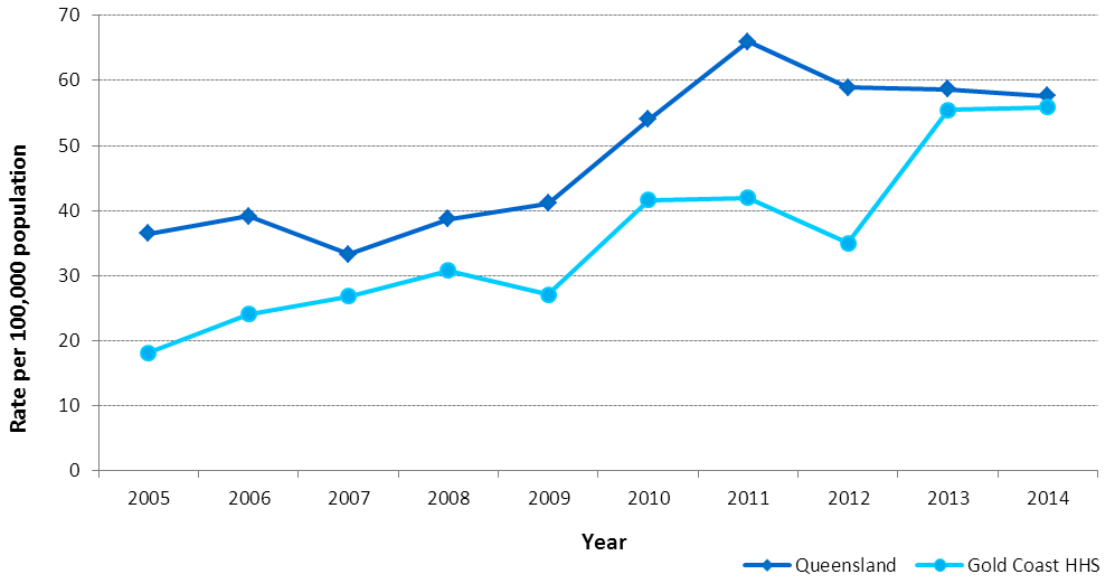
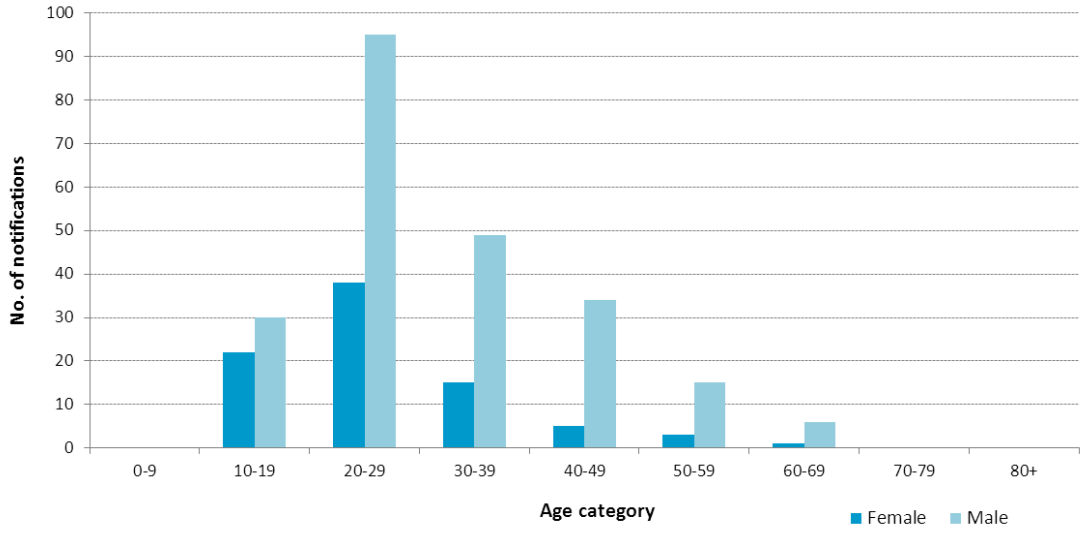


Figure 30 Age and sex distribution of gonorrhoea notifications, Gold Coast Hospital and Health Service 2014



Syphilis

Syphilis is transmitted primarily by sexual contact or during pregnancy from a mother to her foetus. It is caused by the bacterium *Treponema pallidum*. There are approximately 200 new cases reported in Queensland each year.

There were 62 notifications of syphilis in 2014. The notification rate of syphilis in the Gold Coast was 11.6 per 100,000 population, which was slightly higher than Queensland (8.3 per 100,000) (figure 31). This is the highest notification rate in the Gold Coast since 2005. Overall, the annual gonorrhoea notification rate trended upward in both populations over a ten year period.

Notifications for syphilis were not evenly distributed across age and sex groups (figure 32). The majority of notifications were for adults 20-59 years of age, of which the greatest proportion of notifications were for adults 30-39 years of age (85% and 31%, respectively). No notifications were recorded for children or adolescents under the age of 20. Ninety-eight percent of all notifications were reported for males.

Figure 31 Syphilis notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

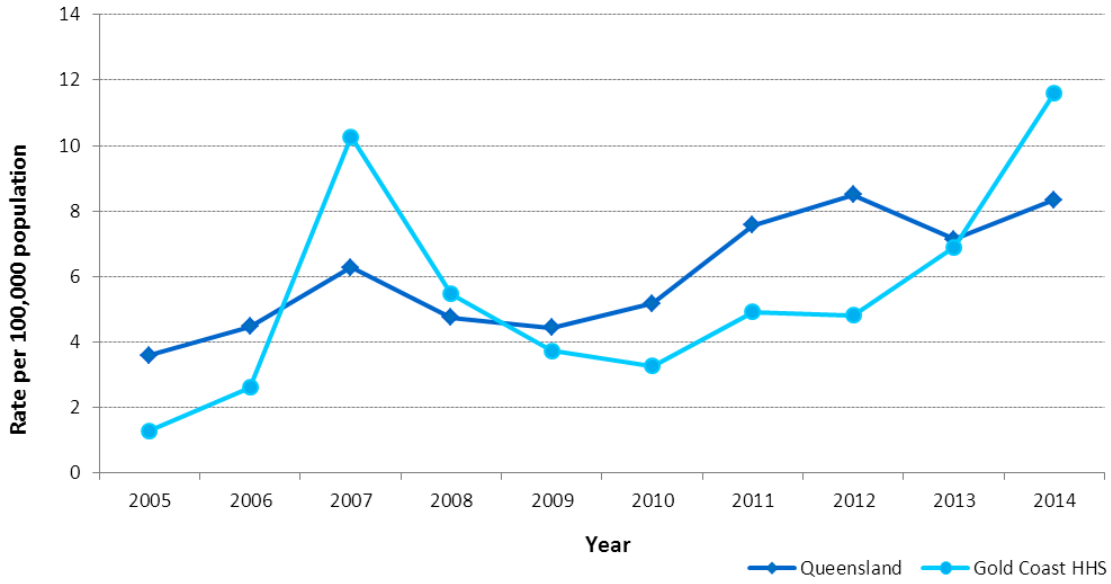
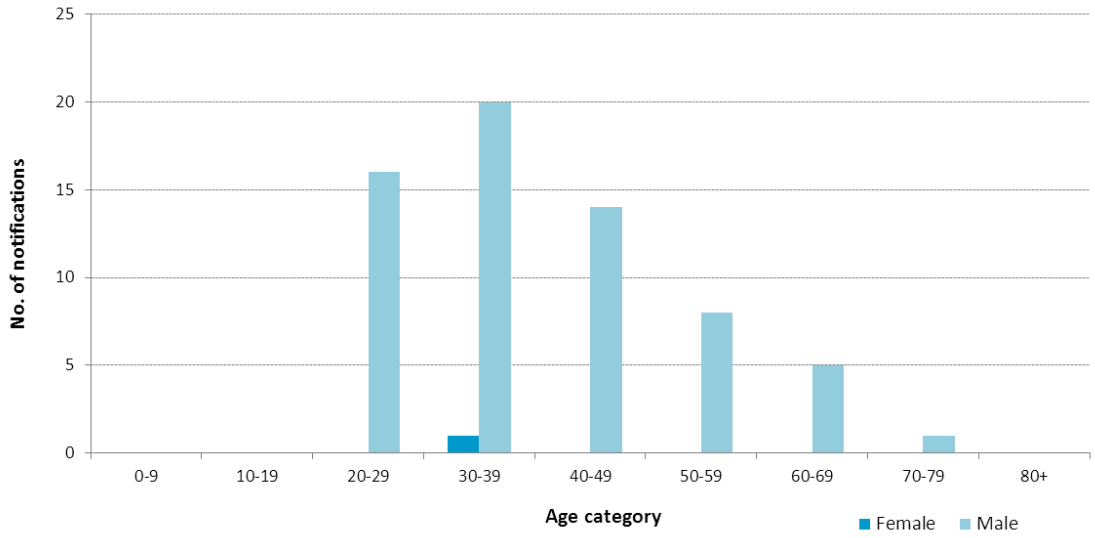


Figure 32 Age and sex distribution of syphilis notifications, Gold Coast Hospital and Health Service 2014



Arboviral disease

Ross River Virus

Ross River virus is a disease carried by female mosquitos that have fed on the blood of an infected animal, and is spread by the bite of an infected mosquito. Ross River virus occurs widely in Australia. In northern and central Queensland, cases of Ross River virus occur throughout the year, but most cases will occur between February and May. All people who become infected with Ross River virus will recover, however the time taken to recover is prolonged in some people.

There were 167 notifications of Ross River virus in 2014. The notification rate of Ross River virus in the Gold Coast was 29.3 per 100,000 population, which was lower than Queensland (49.7 per 100,000) (figure 33). Between 2005 and 2014, considerable fluctuations were observed in both populations; the annual notification rate of ross river virus in the Gold Coast ranged from 8.5 to 39.5 per 100,000 at the lowest and highest point, respectively.

Differences were observed across age and sex groups with regard to Ross River virus notifications (figure 34). Approximately 80% of notifications were reported for adults aged 20 to 59 years of age, the greatest number of which was recorded for adults aged 20-29 years of age (28%). With the exception of adults aged 80 years and older, the number of female notifications was greater than that recorded for males.

Figure 33 Ross River virus notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014

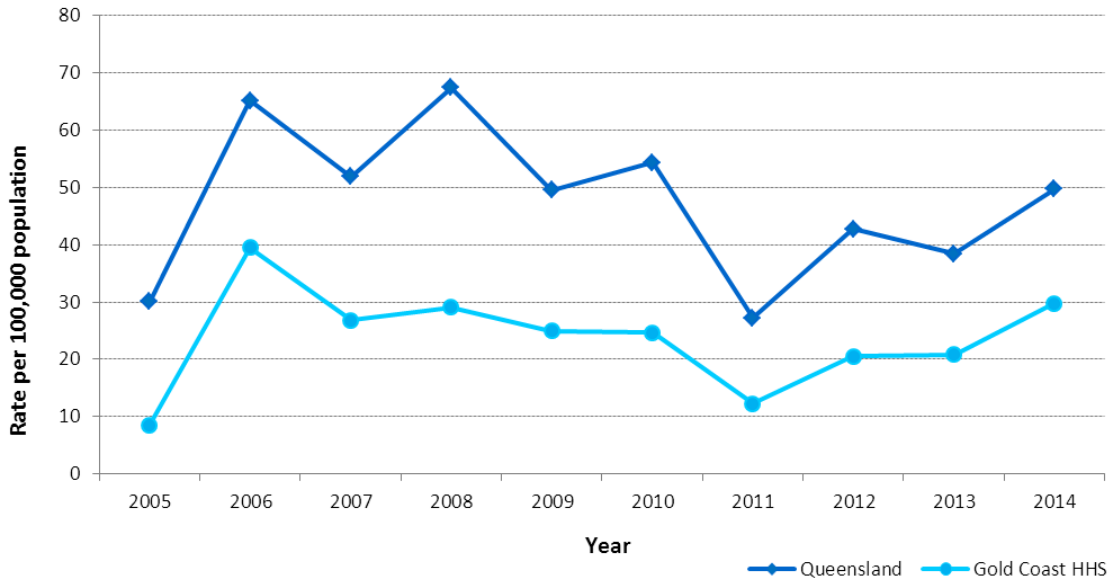
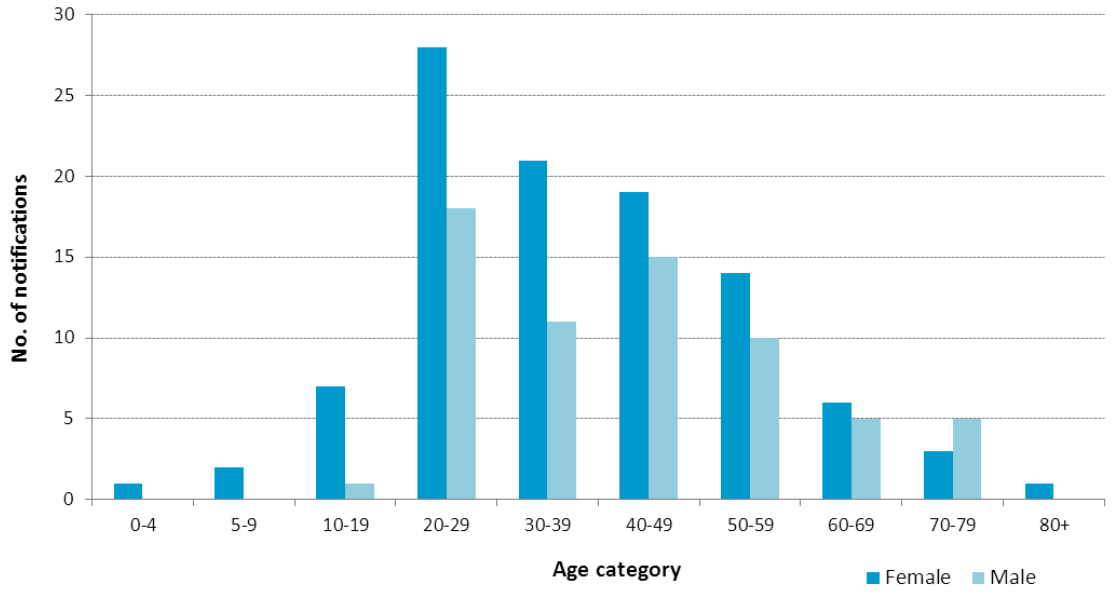


Figure 34 Age and sex distribution of Ross River virus notifications, Gold Coast Hospital and Health Service 2014



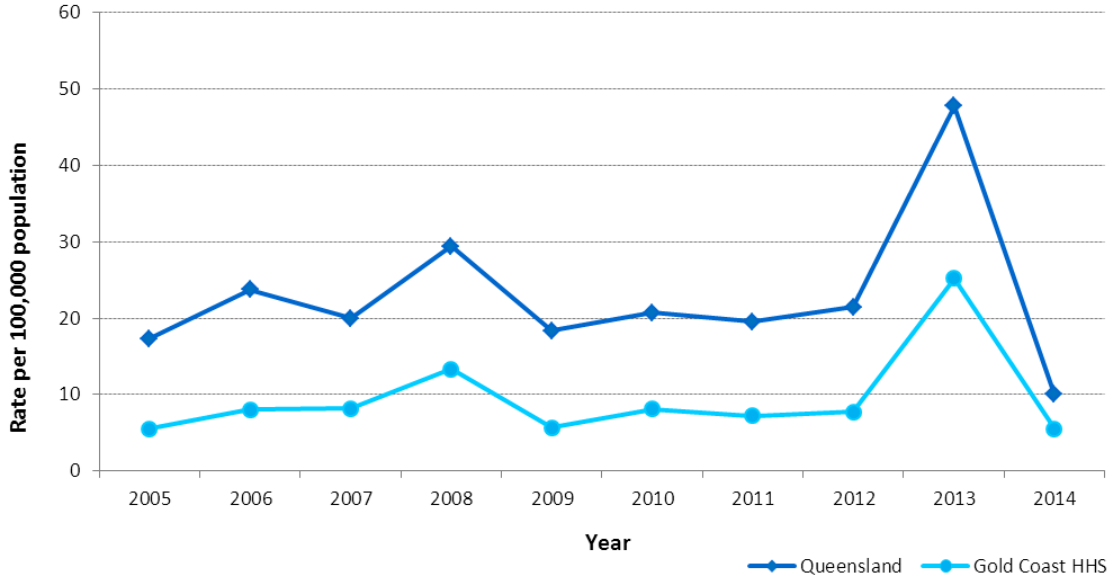
Barmah Forest Virus

Barmah Forest virus is carried by mosquitos, of which may have contracted the virus from infected marsupials, mainly kangaroos and wallabies. Australia is the only country where Barmah Forest virus has been identified. All people who develop the disease recover.

There were 31 notifications of Barmah Forest Virus in 2014. The notification rate of Barmah Forest Virus in the Gold Coast was 5.5 per 100,000 population, half the rate in Queensland (10 per 100,000) (figure 35). Caution is recommended when making historical comparisons of Barmah Forest cases, due to the high number of false positive notifications related to a commercial serology kit. For this reason, figures for 2013 should not be compared with previous years.

Age and sex distribution is not described due to a small number of notifications in 2014.

Figure 35 Barmah Forest virus notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014



Note 1: Caution is recommended when making historical comparisons of Barmah Forest notifications, due to a high number of false positive notifications related to a commercial serology kit in 2013.

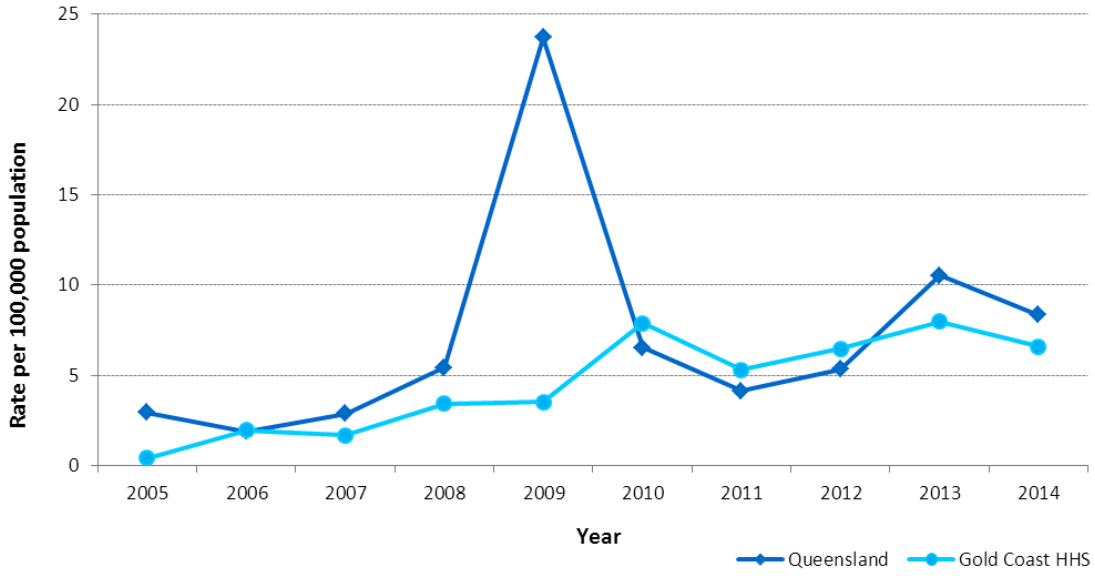
Dengue Fever

Dengue fever is a viral disease spread by mosquitos in tropical and subtropical regions. The disease ranges in severity from a mild flu-like illness through to the more severe forms of the illness, dengue haemorrhagic fever and dengue shock syndrome. There is no specific medical treatment and no vaccine for Dengue fever.

There were 37 notifications of Dengue fever in the Gold Coast in 2014. The notification rate of Dengue fever was 6.6 per 100,000 population, which was lower than in Queensland (8.3 per 100,000) (figure 36). It is important to note all cases of Dengue fever were imported, i.e. there were no locally acquired cases of Dengue fever in the Gold Coast.

Due to a small number of Dengue fever notifications in 2014, age and sex distribution is not described.

Figure 36 Dengue fever notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014



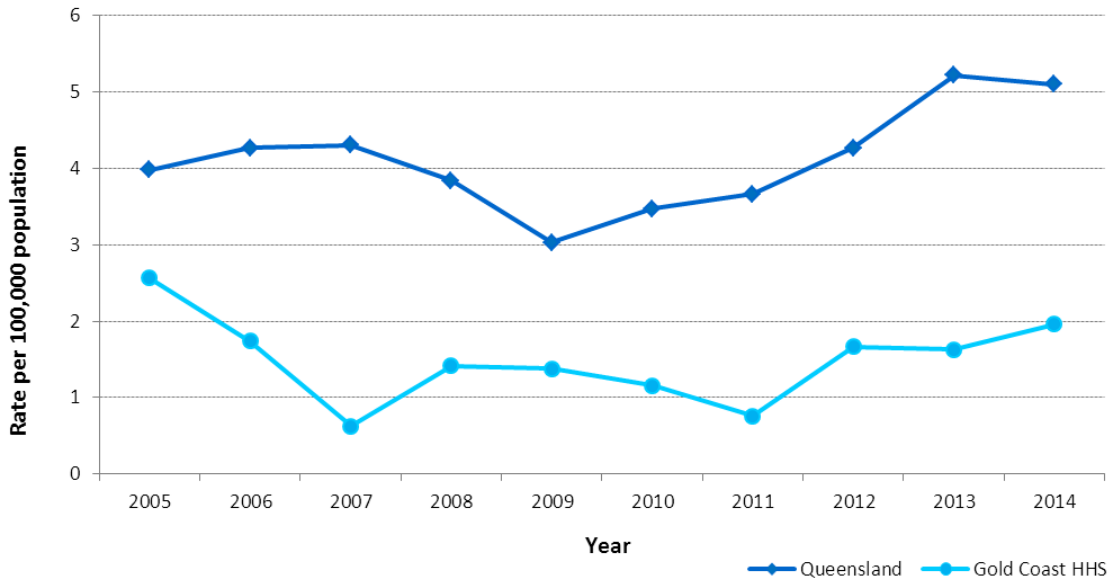
Other disease

Q Fever

Q fever is an illness caused by the bacteria *Coxiella burnetti*. The main carriers of the disease are farm animals, such as cattle, sheep and goats. The bacteria can survive harsh conditions and remain in the environment for long periods of time, so hay, dust and other small particles may also carry the bacteria.

There were 11 notifications of Q fever in the Gold Coast in 2014. The notification rate was 2 per 100,000 population, which was less than in Queensland (5.1 per 100,000) (figure 37). Due to the small number of notifications, age and sex distribution of Q fever is not described.

Figure 37 Q fever notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014



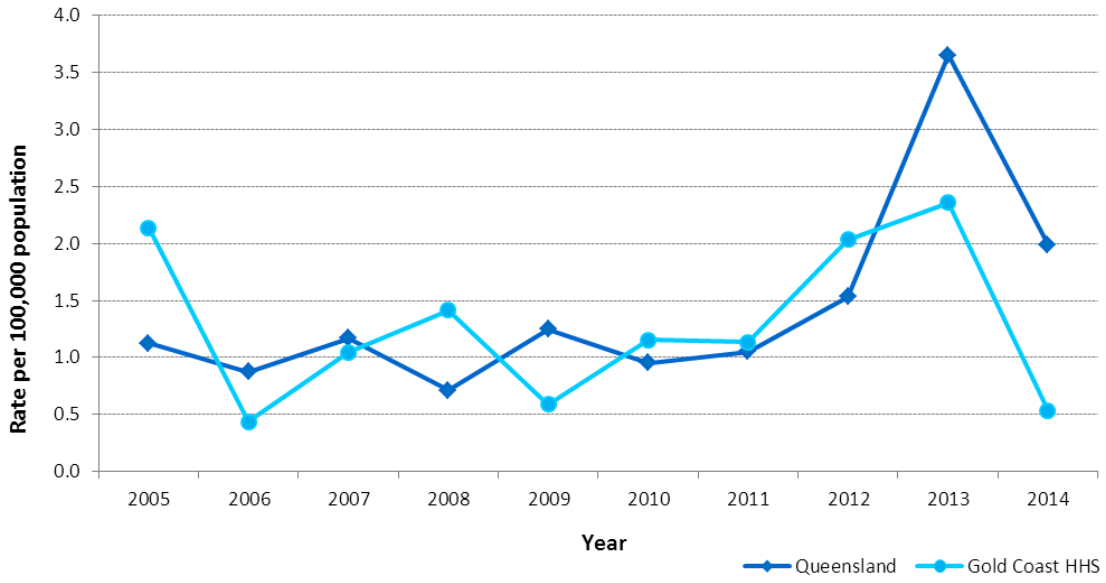
Legionella

Legionnaires' disease is caused by a type of bacteria called Legionella. The bacteria grow best in warm water, like the kind found in hot tubs, large plumbing systems and decorative fountains. Transmission is by breathing in a mist or vapour containing the bacteria.

There were fewer than four notifications of legionella in the Gold Coast in 2014. The notification rate was 0.5 per 100,000 population, which was lower than in Queensland (2 per 100,000) (figure 38).

Due to the small number of legionella notifications in 2014, age and sex distribution is not described.

Figure 38 Legionella notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014



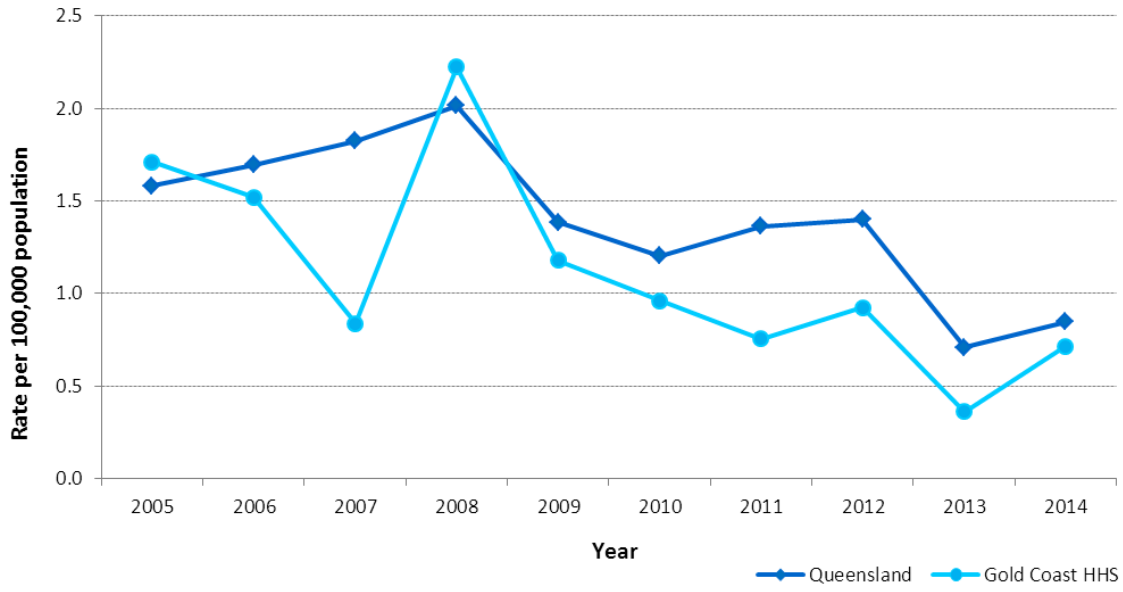
Meningococcal

Meningococcal disease is caused by a bacterium called Neisseria meningitidis (also known as meningococcal bacteria). At any given time, meningococcal bacteria are carried at the back of the throat or in the nose in about 10% of the community. Although most people who have these bacteria in their throat or nose remain quite well, they are able to spread the bacteria to others. These bacteria can cause meningitis and septicaemia, and can lead to permanent disability of death.

Some types of meningococcal disease can be prevented with immunisation. Three types of vaccines are available that provide protection against A, C, W135 and Y strains of meningococcal disease.

There were four notifications of Meningococcal disease in the Gold Coast in 2014. The notification rate was 0.7 per 100, 000 population, which was statistically similar to Queensland (0.8 per 100,000) (figure 39). Due to a small number of Meningococcal notifications, age and sex distribution is not described.

Figure 39 Meningococcal notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014



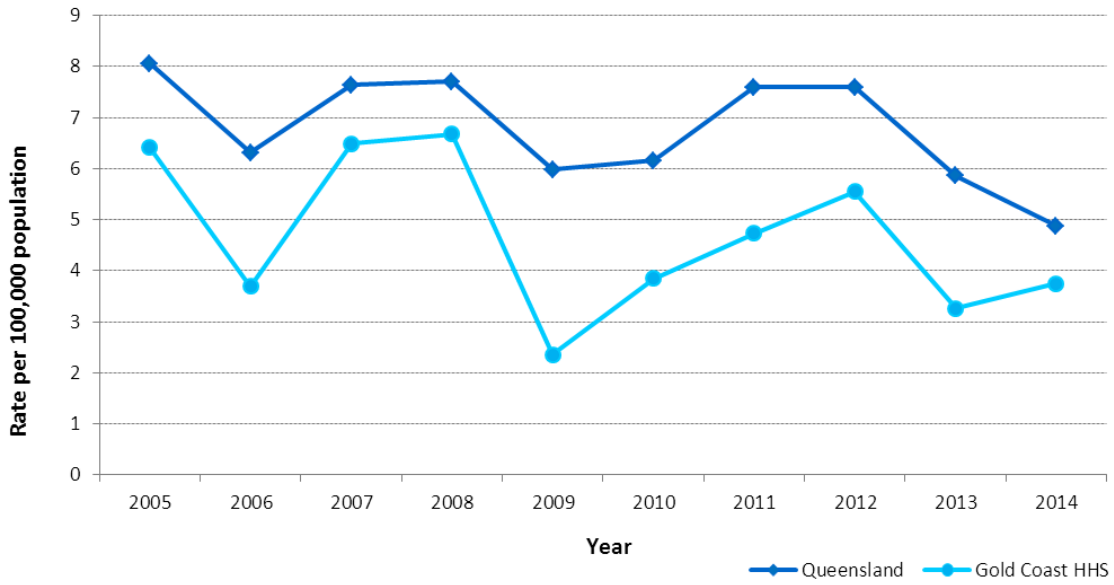
Pneumococcal

Pneumococcal disease is an umbrella term for a range of illnesses caused by infection with the bacteria Streptococcus pneumoniae, commonly known as pneumococcus. The disease can be fatal and include meningitis, pneumonia and bacteraemia.

Pneumococcal can be prevented by immunisation, and is recommended under the NIP schedule at 2, 4 and 6 months for all children, as well as 18 months for Aboriginal and Torres Strait Islander children. Additional doses are recommended for children at medical risk at 12 and 18 months. The vaccine is also recommended for all adults 65 years and older, as well as Aboriginal and Torres Strait Island adults aged 50 years and older, and aged 15-49 years with risk factors.

Twenty-one notifications of pneumococcal disease were recorded in the Gold Coast in 2014. The notification rate was 3.7 per 100,000 population, which was marginally higher than Queensland (4.9 per 100,000) (figure 40). Due to a small number of notifications for pneumococcal disease in 2014, age and sex distribution is not described.

Figure 40 Pneumococcal notification rate by year, Gold Coast Hospital and Health Service and Queensland 2005 to 2014



Potential Rabies/ABLV Exposure

Rabies and Australian bat lyssavirus (ABLV) belong to a group of viruses called lyssaviruses. Rabies is usually transmitted by infected ("rabid") mammals in overseas countries, while ABVL is transmitted by bats in Australia. It is assumed that any bat in Australia could potentially carry ABVL.

Rabies and ABVL are caused by human exposure to saliva or nerve tissue of the infected animal, often by bites and scratches. Unless the animal which has bitten or scratched a person is tested for rabies/ABVL, public health staff can only assume that a potential exposure has occurred.

There were 82 notifications of potential rabies/ABLV exposure in the Gold Coast in 2014. The notification rate was 14.6 per 100,000 population, which was slightly higher than Queensland (12.7 per 100,000) (figure 41).

Approximately 60% of notifications were reported for travellers returning from overseas, most commonly Indonesia and Thailand.

Over half (51%) of the total notifications of potential rabies/ABLV were for adults 20-39 years of age (figure 44). Minor variations were observed between males and females.

Figure 41 Potential Rabies/ABLV exposure notification rate by year, Gold Coast Hospital and Health Service and Queensland 2009 to 2014

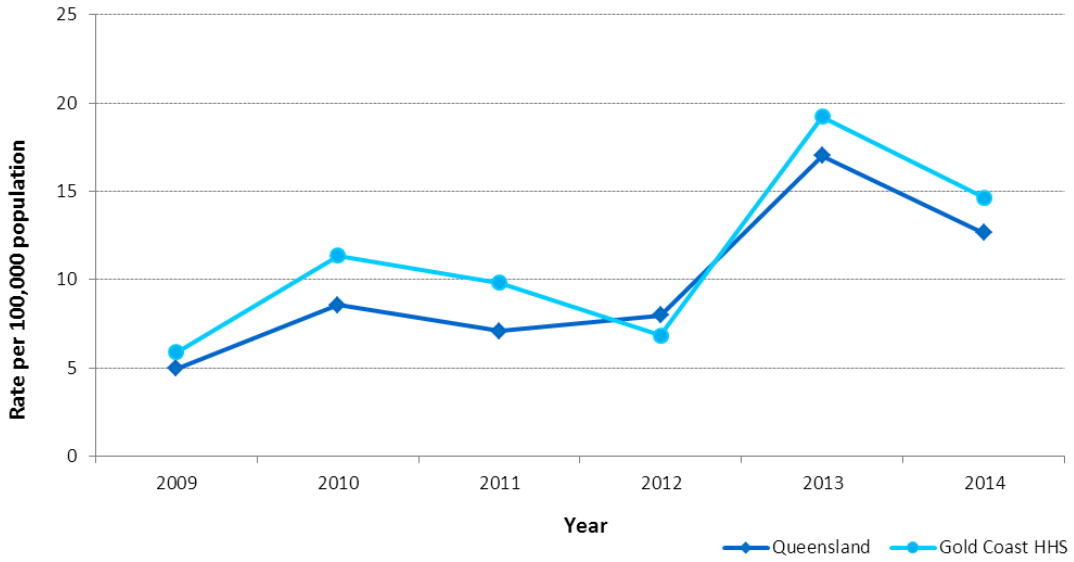
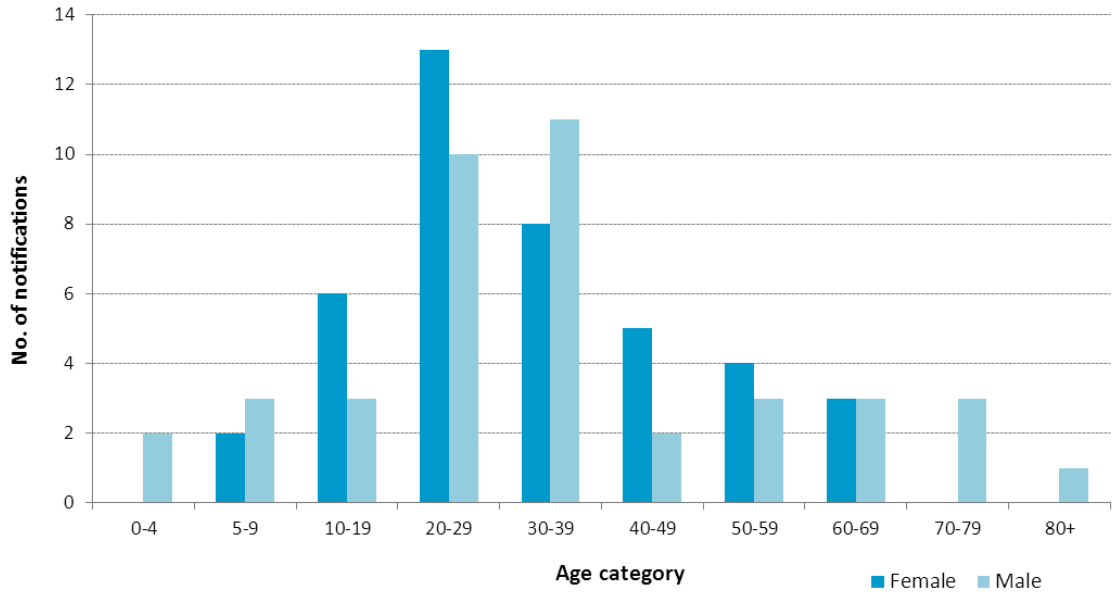


Figure 42 Age and sex distribution of Potential Rabies/Lyssa virus exposure, Gold Coast Hospital and Health Service 2014



References

1. Queensland Health Communicable Disease Control Guidance and Information: A-Z (Disease specific fact sheets, Queensland Guidelines and other information) at http://www.health.qld.gov.au/cdcg/index/default.asp

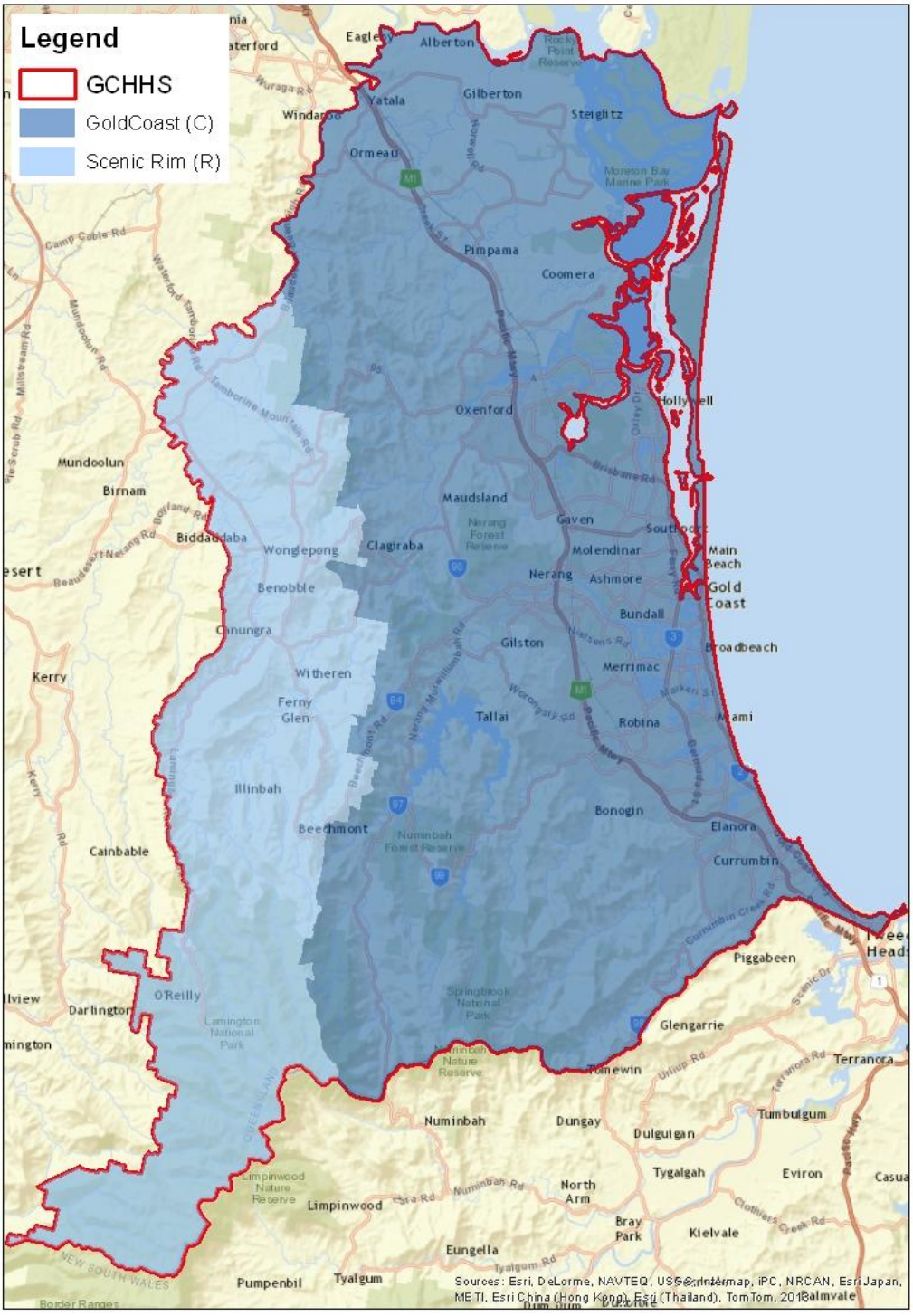
2. Queensland Health Immunisation Schedule at http://www.health.qld.gov.au/clinical-practice/guidelines-procedures/diseases-infection/immunisation/schedule/default.asp

3. Queensland Health School Immunisation Program at http://www.health.qld.gov.au/clinical-practice/guidelines-procedures/diseases-infection/immunisation/schools/default.asp

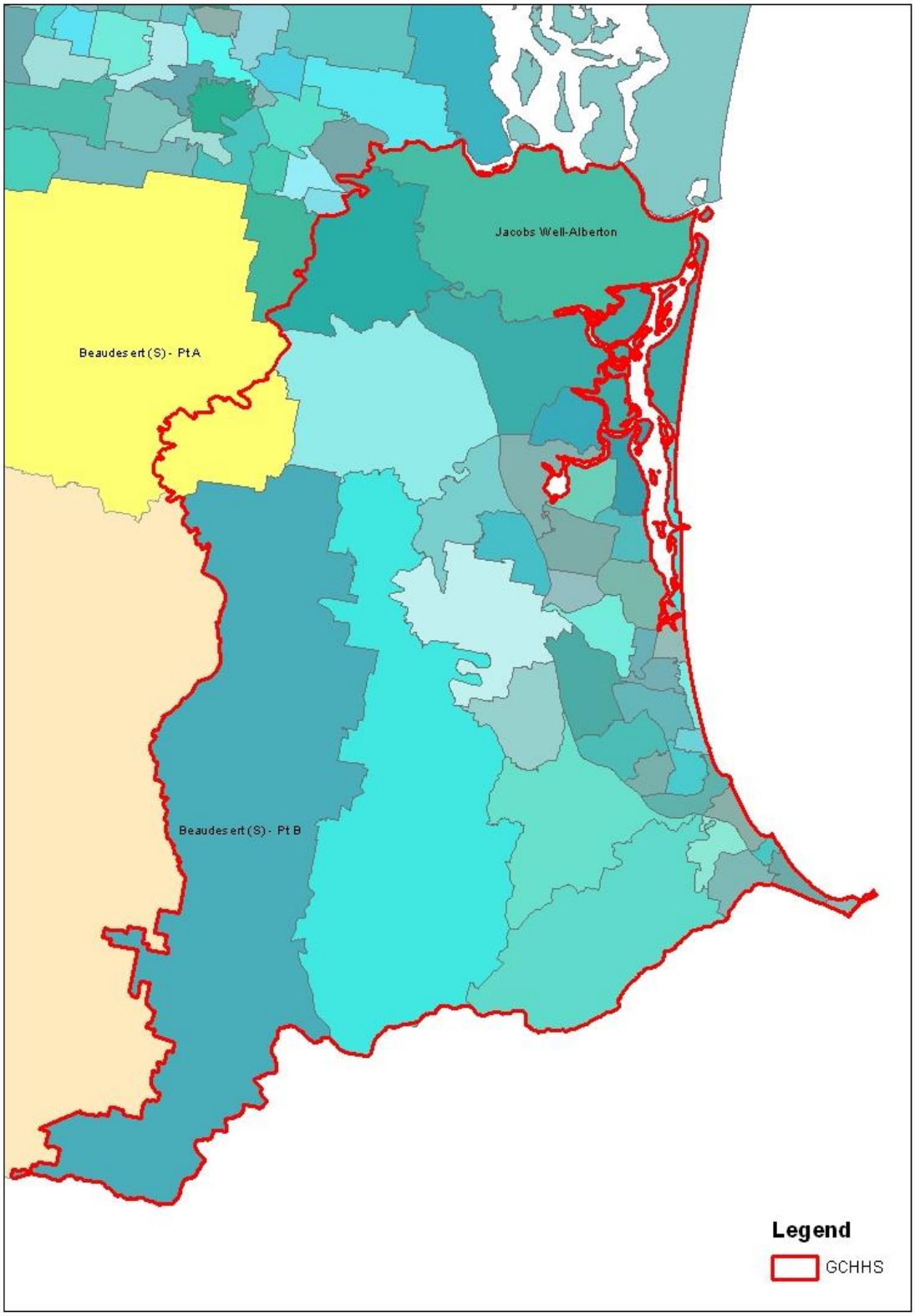
4. Queensland Regional Profiles: Residential Profile for Gold Coast Statistical Area Level 4, Queensland Statistician's Office, Queensland Treasury at http://statistics.qgso.qld.gov.au/qld-regional-profiles

Appendices

Appendix 1 Map of Gold Coast showing Local Government Areas (LGAs) within the Gold Coast Hospital and Health Service Boundary



Appendix 2 Map of 2006 Statistical Area (SLA) boundaries and Gold Coast Hospital and Health Service boundary



Appendix 3 National Immunisation Program Schedule Queensland (March 2015) adapted from the Queensland Immunisation Schedule and Queensland School Immunisation Schedule

Age	Vaccine	Children medically at risk	Aboriginal and Torres Strait Islander
Birth	Hepatitis B		BCG (tuberculosis)
2 months	Hepatitis B, Diptheria, Tetanus, Whooping Cough (pertussis) Haemophilus influenzae type b, Polio (poliomyelitis) Pneumococcal, Rotavirus		Influenza (from 6 months to less than 5 years of age)
4 months	Hepatitis B, Diptheria, Tetanus, Whooping Cough (pertussis) Haemophilus influenzae type b, Polio (poliomyelitis) Pneumococcal, Rotavirus		
6 months	Hepatitis B, Diptheria, Tetanus, Whooping Cough (pertussis) Haemophilus influenzae type b, Polio (poliomyelitis) Pneumococcal, Rotavirus		
12 months	Haemophilus influenzae type b, Meningococcal C Measles, Mumps, Rubella	Pneumococcal	Hepatitis A
18 months	Measles, Mumps, Rubella, Chickenpox (varicella)		Hepatitis A Pneumococcal
4 years	Diptheria, Tetanus, Whooping Cough (pertussis), Polio (poliomyelitis)	Pneumococcal	
Year 8 student	Human Papillomavirus (3 doses - 0, 2 and 6 months) Diptheria, Tetanus, Whooping Cough (pertussis) Chickenpox (varicella))		
Year 10 student	Diptheria, Tetanus, Whooping Cough (pertussis) - until the end of 2015		
Adults (15 - 65 years)			Influenza Pneumococcal

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