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Surveillance summary

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Abstract

The implementation of public health measures to control the current COVID-19 pandemic (such as wider lockdowns, overseas travel restrictions and physical distancing) is likely to have affected the spread of other notifiable diseases. This is a descriptive report of communicable disease surveillance in Central Queensland (CQ) for six months (1 April to 30 September 2020) after the introduction of physical distancing and wider lockdown measures in Queensland. The counts of notifiable communicable diseases in CQ in the six months were observed and compared with the average for the same months during the years 2015 to 2019. During the study's six months, there were notable decreases in notifications of most vaccine-preventable diseases such as influenza, pertussis and rotavirus. Conversely, notifications increased for disease groups such as blood-borne viruses, sexually transmitted infections and vector-borne diseases. There were no reported notifications for dengue fever and malaria which are mostly overseas acquired. The notifications of some communicable diseases in CQ were variably affected and the changes correlated with the implementation of the COVID-19 public health measures.

Key words: COVID-19; public health measures; communicable diseases; Central Queensland; Australia

Background

The current COVID-19 pandemic has led to some significant changes to local, regional and national public health practices including social distancing and wider lockdown. These measures have been previously reported to be associated with reductions in the incidence of gastrointestinal and respiratory diseases as well as of other airborne transmitted agents.^{1,2} A preliminary analysis was conducted assessing the impact of these measures on nationally notifiable diseases across Australia;³ however, the impact of these measures on communicable diseases within regional Australia is not well established. Like most regional areas, Central Queensland (CQ) has a lower population density and considerable distance from major cities; it will be informative to understand how these measures impact on notifiable conditions in this regional setting.

We aimed to identify the patterns of change in reported notifiable conditions to the Central Queensland Public Health Unit (CQPHU), during a six-month period (1 April to 30 September 2020) following the implementation of COVID-19 measures. Here, we compare these notifications to the surveillance data for the same six-month period for the previous five years (2015 to 2019).

Methods

The study encompasses all notifiable conditions reported from CQ, which covers approximately 226,000 population and is spread over 117,588 square kilometres. Communicable diseases data were retrieved from the Queensland Notifiable Conditions System (NoCS), an online epidemiological database, from 1 January 2015 to 30 September 2020. The data were collected under the *Public Health Act 2005*, a legislative authority

that provides permission to access health information. Permission to publish was given by the Communicable Diseases Branch of Queensland.

Data were extracted on selected notifiable diseases in Queensland: blood-borne viruses (BBV), gastrointestinal diseases, sexually transmitted infections (STIs), vaccine-preventable diseases (VPDs), vector-borne diseases, zoonotic diseases and other diseases. For each disease, the count for six months following the implementation of COVID-19 public health measures (1 April to 30 September 2020) was compared with the average for the same six-month period during the years 2015 to 2019.

Results

From 1 April to 30 September 2020, after the implementation of Queensland's COVID-19 preventive measures, there was a decrease seen in several diseases notifications reported to the CQPHU, mostly VPDs, when compared with the same months for each of 2015 to 2019 and for the 5-year average (2015–2019) for those months (Table 1). However, increases in notifications for April–September 2020 were observed in a greater number of other notifiable disease groups.

Diseases with decreased notifications

In the six-month period, notifications decreased compared to the 5-year average for gastrointestinal disease: cryptosporidiosis (5 vs. 40, decrease = 87%); VPDs: influenza (10 vs. 1535, decrease = 99%), pertussis (5 vs. 40, decrease = 87%), rotavirus (3 vs. 35, decrease = 91%) and varicella zoster-unspecified (41 vs. 104, decrease = 61%). Notifications for these diseases in 2020 were less than in the same period in each of the years 2015 to 2019.

Diseases with increased notifications

Observed notifications from 1 April to 30 September 2020 were more than the 5-year average for the same period for BBV: newly-acquired hepatitis C (37 vs. 17, increase = 118%); STIs: gonococcal infection (156 vs. 56, increase

= 179%) and syphilis < 2 years duration (21 vs. 12, increase = 75%); vector-borne diseases: Ross River virus (154 vs. 94, increase = 64%) and Barmah Forest virus (13 vs. 7, increase = 86%); and zoonotic disease – Q fever (15 vs. 6, increase = 150%). Notifications for these diseases in 2020 were more than in the same period in each of the years 2015 to 2019.

Zero notification

There was no notification of dengue fever, malaria, newly-acquired hepatitis B or mumps from 1 April to 30 September 2020.

Discussion

To the best of our knowledge, this is the first report to assess the effect of the COVID-19 public health measures on notifiable diseases in any regional area in Australia. This information is important for public health service planning and delivery in regional and rural areas where maintaining routine public health services, along with the COVID-19 pandemic response, is equally important and challenging. This report suggests that the wider lockdown, overseas travel restrictions, social and physical distancing and hygiene etiquettes may have contributed to the reduction in transmission of cryptosporidiosis, influenza, pertussis, rotavirus and varicella zoster (unspecified) in Central Queensland. Decreased notifications for respiratory diseases and rotavirus in Australia were also reported months after the implementation of COVID-19 measures.^{3,4} The observed reduction in 2020 in CQ, particularly for the VPDs, highlights how conventional infection control practices could play a major role in preventing outbreaks of respiratory infections. Wider lockdowns, physical distancing measures, restrictions on larger gatherings, wider use of masks, remote work arrangements, and increased awareness of hand hygiene all may have contributed to the reduction of VPDs in CQ. Further research following findings from this report should identify the most effective measures that contributed to the low numbers of VPDs in CQ.

Table 1: Number of notifiable diseases by disease group, reported to CQPHU, 1 April to 30 September, 2015–2020

Diseases	2015	2016	2017	2018	2019	5-year average (2015–2019)	2020	Ratio (2020 vs. 5-year average)
Blood-borne diseases								
Hepatitis B (newly acquired)	1	1	1	0	2	1	0	–
Hepatitis B (unspecified)	9	14	6	4	5	8	10	1.25
Hepatitis C (newly acquired)	13	10	22	12	26	17	37	2.18
Hepatitis C (unspecified)	49	54	62	56	55	55	38	0.69
Gastrointestinal diseases								
Campylobacteriosis	121	172	151	165	181	158	145	0.92
Cryptosporidiosis	14	101	41	10	34	40	5	0.13
Haemolytic uraemic syndrome (HUS)	0	1	1	0	0	0	2	5.00
Salmonellosis	122	159	122	123	85	122	90	0.74
Shigellosis	2	0	15	1	3	4	8	2.00
Shiga toxin-producing <i>Escherichia coli</i> (STEC)	2	1	3	0	1	1	1	1.00
Yersiniosis	26	16	13	8	10	15	8	0.53
Sexually transmissible infections								
Chlamydial infection	494	538	490	451	521	499	449	0.90
Gonococcal infection	20	50	52	45	111	56	156	2.79
Syphilis < 2 years duration	14	6	13	15	11	12	21	1.75
Vaccine-preventable diseases								
<i>Haemophilus influenzae</i> type b	0	0	0	2	0	0	1	–
Influenza	1,079	655	1,811	460	3,671	1,535	10	0.01
Mumps	0	0	1	22	1	5	0	–
Pertussis	19	28	55	15	83	40	5	0.13
Pneumococcal disease (invasive)	9	16	10	14	9	12	10	0.83
Rotavirus	19	37	58	19	42	35	3	0.09
Varicella zoster (chickenpox)	6	3	4	8	63	17	11	0.65
Varicella zoster (shingles)	1	0	2	84	105	38	95	2.50
Varicella zoster (unspecified)	120	138	163	53	48	104	41	0.39
Vector-borne diseases								
Ross River virus	104	68	100	109	88	94	154	1.64
Barmah Forest virus	7	11	6	9	4	7	13	1.86
Dengue fever	3	6	0	1	22	6	0	–
Flavivirus	0	0	0	0	3	1	3	3.00
Malaria	0	1	1	2	1	1	0	–
Zoonotic disease								
Leptospirosis	2	0	3	1	0	1	2	2.00
Creutzfeldt-Jakob disease	0	0	0	0	1	0	1	5.00
Q fever	12	3	4	3	6	6	15	2.50
Other diseases								
Legionellosis	3	2	3	1	1	2	1	0.50
Meningococcal disease (invasive)	2	2	5	3	6	4	2	0.50

On the other hand, notifications increased for blood-borne viruses and sexually transmissible infections such as newly-acquired hepatitis C, gonorrhoea (STI), and infectious syphilis (less than 2 years duration). There have been suggestions of a possible future reduction in incidence of STIs as a result of COVID-19 isolation measures;⁵ however, the current report shows contrary results. This is likely due to ongoing syphilis and gonorrhoea outbreaks in the region since early 2019.⁶ The increase in the number of gonorrhoea and syphilis notifications in CQ is a major concern, potentially indicating that the implemented measures might not have inhibited risky behaviours. Increased testing will lead to a rise in case detection; however, data were unavailable to account for changes in testing rates in 2020 compared to previous years.

We have also observed an increase in vector-borne infections which include Ross River virus, Barmah Forest virus and Q fever in 2020, compared to the same period in 2015–2019. The implemented COVID-19 restrictions limited movements of people, which potentially may have provided CQ residents with the opportunity to spend more time around their homes and exercising locally outdoors, resulting in increased risk of vector-borne diseases such as Ross River virus and Barmah Forest virus.⁷ Further investigation is required to determine whether increased cases of these mosquito-borne diseases may have resulted from an increased mosquito abundance due to favourable environmental conditions, or was perhaps due to changes in human behaviour resulting in increased exposure to mosquitoes.⁷ Also, the increase in notifications of Q fever may be a result of spending more time with livestock and around households where wildlife, such as kangaroos, may be present.

International travel restrictions have potentially contributed to the zero notifications observed for dengue and malaria.

The study's limitations include a potential decline in healthcare presentations by individuals for fear of exposure to patients with

COVID-19. Also, potentially, there might have been a reduction of testing for other communicable diseases due to the high numbers of COVID-19 test requests.

Conclusion

The implemented COVID-19 public health measures might have contributed to a decrease in some VPDs in CQ. There were increases in several STIs, vector-borne diseases and conditions in other disease groups, suggesting more research is needed into the factors underlying such increases. There was no reported notification for dengue fever and malaria which are mostly acquired from overseas travel. Long term investigation into pattern of disease notifications may provide additional information on the impact of the implemented measures on notifiable diseases in CQ.

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