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Short report

Physical distancing and non-respiratory notifiable diseases in the Northern Territory, March-May 2020

Ouli Xie, Peter G Markey, Anthony D K Draper, Vicki L Krause

Abstract

Strict physical distancing measures and border controls have been introduced in the Northern Territory (NT), and across Australia, to reduce the spread of coronavirus disease 2019 (COVID-19). These measures have been associated with reduced incidence of other respiratory illnesses such as influenza. It is currently unclear what effect these measures have on non-respiratory communicable diseases. The incidence of notifiable non-respiratory communicable diseases within the NT, from 15 March to 15 May 2020, the period of most restrictive physical distancing, was monitored and is here compared with two control periods: (i) the 4 months immediately prior and (ii) the same two-month period from the preceding 5 years. During the study period, there was a decline in incidence of communicable enteric illnesses, particularly in shigellosis and rotavirus where person-to-person spread is the main transmission route. There was an increase in chlamydial conjunctivitis in areas with endemic trachoma, which is under further investigation. There was no observed increase in conditions associated with crowding, such as those related to group A streptococcal infection.

Keywords: epidemiology, COVID-19, physical distancing, Northern Territory, Australia

Background

On 11 March 2020,[1] the World Health Organization (WHO) declared the novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and the disease for which it is responsible, coronavirus disease 2019 (COVID-19), a pandemic. SARS-CoV-2 is thought to spread predominantly by respiratory droplets.[2]

Australia progressively introduced border controls and physical distancing measures to reduce the spread of SARS-CoV-2 from February 2020. From 15 March 2020, all international arrivals were required to quarantine for 14 days. The Northern Territory (NT) introduced further physical distancing measures from 15 March 2020, which restricted gatherings, before progressing to closure of non-essential businesses on 25 March 2020.[3] Indoor and outdoor gatherings were restricted to a maximum of 10 people on 30 March 2020. Restrictions were introduced on 20 March 2020, on travel to remote Aboriginal communities, and travellers entering from interstate were required to quarantine for 14 days from 24 March 2020. Public health messaging also promoted careful hand hygiene, environmental cleaning, and self-isolation when unwell. Physical distancing restrictions were gradually lifted from 15 May 2020.

The NT has a widely distributed, and largely remote, population of approximately 230,000 people, of whom 26% identify as Aboriginal or Torres Strait Islander.[4] There is a disproportionate burden of communicable diseases such as invasive group A streptococcal disease (iGAS) and shigellosis, and a unique spectrum of illnesses such as melioidosis and crusted scabies which are notifiable within the NT but not nationally.[5–8]

Physical distancing measures implemented to reduce the risk of SARS-CoV-2 have been effective at reducing the spread of other respiratory viruses such as influenza.[9] It is unknown what effect these measures have on non-respiratory communicable diseases.

Aim

We aimed to measure and compare the incidences of notifiable non-respiratory communicable diseases in the NT from 15 March 2020 to 15 May 2020, the period of most restrictive physical distancing, with two control periods: (i) the 4 months immediately prior (wet season), 15 November 2019 to 14 March 2020, and (ii) the same period of 15 March to 15 May from the 5 years prior.

Methods

Notifiable disease data were extracted from the NT Notifiable Diseases Surveillance System (NTNDS). Incidence rates were calculated per 100,000 population per month. Incidence rate ratios (IRR) and 95% confidence intervals (95% CI) were calculated by Poisson regression. IRR was only calculated when 10 or more cases per month were reported. Statistical analysis was performed using STATA version 13.0 (College Station, Texas).

As data in this study were collected under the authority of public health legislation, ethics approval was not sought.[10]

Results

During the two months of most restrictive physical distancing measures from 15 March 2020 to 15 May 2020, there was a reduced incidence of enteric illnesses including cryptosporidiosis, rotavirus, shigellosis, and salmonellosis, but not campylobacteriosis (Table 1). Compared to the 4 months prior to 15 March 2020, there was a decline from 6.1 to 0.8 cases per 100,000 population per month (IRR 0.13; 95% CI 0.03–0.58) for rotavirus and from 17.49 to 10.17 cases per 100,000 population per month (IRR 0.58; 95% CI 0.36–0.95) for shigellosis (Table 2). For salmonellosis and cryptosporidiosis, the decline was most marked compared to the 5-year median, from 24 to 13.83 cases per 100,000 population per month (IRR 0.58; 95% CI 0.38–0.88) and from 7.73 to 2.85 cases per 100,000 population per month (IRR 0.37; 95% CI 0.15–0.88), respectively.

There was an increase in chlamydial conjunctivitis to 8.95 cases per 100,000 population per month compared to the preceding 4 months and the 5-year median of 1.63 (IRR 5.50; 95% CI 1.90–15.96) and 0.81 cases per 100,000 population per month (IRR 11.00; 95% CI 2.59–46.78) respectively. During the period of interest there were 44 cases, of which 27 (61%) were in the Alice Springs region and 13 (30%) in the Katherine region. The median age of cases was 9.5 years (IQR 4, 19). All cases were in Aboriginal or Torres Strait Islander people. This increase is the subject of a separate investigation.

There was a trend towards lower incidences of gonococcal infection and trichomoniasis compared to the 5-year median. However, the incidence did not differ compared to the 4 months prior. Rates of syphilis and chlamydia did not differ across the periods.

The incidence of iGAS, acute post-streptococcal glomerulonephritis (APSGN), and rheumatic fever was similar compared to the two control periods. The incidence of crusted scabies and melioidosis was also similar.

Incidence of imported illnesses such as dengue and malaria remained low.

Discussion

During the period of most restrictive physical distancing, there was a decline in enteric illnesses which are predominantly transmitted person-to-person, such as rotavirus and shigellosis, compared to the 4 months of the NT wet season immediately prior. The decline for salmonellosis and cryptosporidium, for which

Table 1. Number of cases during period of NT physical distancing (15 March to 15 May 2020) compared to control periods

	Median number of cases (n) per month		
	15 March *2020* **–15 May** *2020*	**15 November** *2019* **– 14 March** *2020*	**15 March – 15 May**, *2015–2019*
Acute post-streptococcal glomerulonephritis	2	1	3.5
Campylobacteriosis	37	32	34
Chlamydia	235.5	246	246.5
Chlamydial conjunctivitis	22	4	1.5
Crusted scabies	4	5	4
Cryptosporidiosis	6.5	10	18.5
Dengue	1	4	6
Gonococcal infection	94.5	96	161
Invasive group A streptococcus	4.5	5	6.5
Malaria	0.5	0.5	0.5
Melioidosis	7.5	5.5	7
Meningococcal	0	0	0.5
Invasive pneumoccocal	2.5	4	4
Rheumatic fever	9.5	14	10
Ross River Virus	15.5	8	16.5
Rotavirus	2	15	5.5
Salmonellosis	34	48	58.5
Shigellosis	24.5	43	30.5
Syphilis	30	32	25.5
Trichomoniasis	230	230.5	300.5
Varicella	6	8.5	7
Yersiniosis	1	1.5	1.5

person-to-person transmission plays a minor role, was less marked and there was no change for campylobacteriosis.

Compared to the same period from the previous 5 years, the decline in rotavirus and shigellosis was less marked but there was a decline in salmonellosis and cryptosporidium. While hygiene measures may have contributed, the decline in salmonella and cryptosporidium—where environmental acquisition predominates—cannot be readily attributed to physical distancing measures and may be due to yearly variation.

There was an increase in chlamydial conjunctivitis, which remains under investigation and which occurred in areas known to be endemic for trachoma.[11] It has not clearly been linked with physical distancing measures.

There is a disproportionate burden of communicable diseases in the Aboriginal and Torres Strait Islander population in the NT. In addition to enteric illnesses, up to 8 times the incidence of iGAS occur in the Aboriginal and Torres Strait Islander population compared to the Non-Indigenous population, particularly in remote

Table 2. Incidence and incidence rate ratios during period of NT physical distancing (15 March to 15 May 2020) compared to control periods

	15 March – 15 May 2020	15 November 2019 – 14 March 2020			5-year median between 15 March and 15 May, 2015–2019		
	Incidence per 100,000/ month	*Incidence per 100,000/ month*	*Incidence rate ratio*	*95% CI*	*Incidence per 100,000/ month*	*Incidence rate ratio*	*95% CI*
Campylobacteriosis	15.05	13.02	1.16	0.72–1.86	13.83	1.09	0.68–1.73
Chlamydia	95.99	100.05	0.96	0.80–1.15	100.46	0.96	0.80–1.15
Chlamydial conjunctivitis	8.95	1.63	5.50	1.90–15.96	0.81	11.00	2.59–46.78
Cryptospordiosis	2.85	4.07	0.70	0.27–1.84	7.73	0.37	0.15–0.88
Gonococcal infection	38.64	39.05	0.99	0.75–1.31	65.48	0.59	0.46–0.76
Rheumatic fever	4.07	5.70	0.71	0.32–1.61	4.07	1.00	0.42–2.40
Ross River Virus	6.51	3.25	2.00	0.86–4.67	6.91	0.94	0.48–1.86
Rotavirus	0.80	6.10	0.13	0.03–0.58	2.44	0.33	0.67–1.65
Salmonellosis	13.83	19.52	0.71	0.46–1.10	24	0.58	0.38–0.88
Shigellosis	10.17	17.49	0.58	0.36–0.95	12.61	0.81	0.48–1.37
Syphilis	12.20	13.02	0.94	0.57–1.54	10.57	1.15	0.68–1.95
Trichomoniasis	93.55	93.95	1.00	0.83–1.20	122.42	0.76	0.64–0.91

settings.[5,6] Concerns regarding travel restrictions, return of residents to remote communities, and stay-at-home orders leading to an increase in crowding and to group A streptococcal (GAS)-related diseases or crusted scabies were not observed. However, APSGN or rheumatic fever occurs several weeks after GAS infection and therefore effects may be delayed.

Rates of sexually transmitted infections (STI) did not change significantly from the preceding 4 months, suggesting little effect of physical distancing measures. However, data on STI testing were not available to account for differences in testing rates.

The incident rates of imported illnesses, such as dengue, were low in the setting of international travel restrictions. During the observed period, only 1 case of dengue was notified compared to a median of 6 cases over the same period in the previous 5 years.

Limitations of this study include a possible unmeasured effect of reduced testing and healthcare presentations. It has been observed that restrictions have resulted in lower presentations to healthcare in other settings.[12]

Conclusion

Physical distancing, and promotion of other non-pharmaceutical interventions such as hand hygiene and environmental cleaning, coincided with a decrease in enteric illnesses (except campylobacteriosis) in the NT, suggesting a possible unintended benefit. There was an increase in chlamydial conjunctivitis but may be unrelated to physical distancing measures. There was no observed increase in conditions associated with crowding such as those related to GAS infection. Ongoing surveillance of trends in non-respiratory disease notifications may provide further information regarding the influence of these public health measures, particularly with easing of restrictions and approaching future NT wet seasons.

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References

1. World Health Organization (WHO). WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020. [Internet.] Geneva: WHO; 11 March 2020. [Accessed on 26 July 2020.] Available from: https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.

2. WHO. Transmission of SARS-CoV-2: implications for infection prevention precautions. Scientific brief. [Internet.] Geneva: WHO; 9 July 2020. [Accessed on 26 July 2020.] Available from: https://www.who.int/publications/i/item/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations.

3. Northern Territory Government. Coronavirus (COVID-19): Chief Health Officer Directions. [Internet.] Darwin: Northern Territory Government; 2020. [Accessed on 26 July 2020.] Available from: https://coronavirus.nt.gov.au/chief-health-officer-directions.

4. Australian Bureau of Statistics. 2016 Census QuickStats: Northern Territory. [Internet.] Canberra: Australian Burea of Statistics; 12 July 2019. [Accessed on 26 July 2020.] Available from: https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/7.

5. Draper A., Markey P. *Shigella flexneri* 2b in the Northern Territory in 2017. *N T Dis Control Bull*. 2017;24(4):1–6.

6. Boyd R, Patel M, Currie BJ, Holt DC, Harris T, Krause V. High burden of invasive group A streptococcal disease in the Northern Territory of Australia. *Epidemiol Infect*. 2016;144(5):1018–27.

7. Cheng AC, Currie BJ. Melioidosis: epidemiology, pathophysiology, and management. *Clin Microbiol Rev*. 2005;18(2):383–416.

8. Quilty S, Kaye TS, Currie BJ. Crusted scabies in northern and central Australia – now is the time for eradication. *Med J Aust*. 2017;206(2):96.

9. Cowling BJ, Ali ST, Ng TWY, Tsang TK, Li JCM, Fong MW et al. Impact assessment of non-pharmaceutical interventions against coronavirus disease 2019 and influenza in Hong Kong: an observational study. *Lancet Public Health*. 2020;5(5):e279–88.

10. Northern Territory Government. Northern Territory Legislation. *Public and Environmental Health Act 2011*. [Internet.] Darwin: Northern Territory Government; 2020. [Accessed on 26 July 2020.] Available from: https://legislation.nt.gov.au/en/Legislation/PUBLIC-AND-ENVIRONMENTAL-HEALTH-ACT-2011.

11. National Trachoma Surveillance and Reporting Unit. *Australian Trachoma Surveillance Report 2018*. Sydney: The Kirby Institute, UNSW; 2019. Available from: https://www1.health.gov.au/internet/main/publishing.nsf/Content/1B9028E9FD71332ACA257BF00018CCD6/$File/Australian%20Trachoma%20Surveillance%20Report%202018.pdf.

12. De Filippo O, D'Ascenzo F, Angelini F, Bocchino PP, Conrotto F, Saglietto A et al. Reduced rate of hospital admissions for ACS during Covid-19 outbreak in northern Italy. *N Engl J Med*. 2020;383(1):88–9.