

COVID-19 outbreaks in health and care settings during SARS-CoV-2 variant dominant waves in Ireland, 2020 - 2024

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Introduction

- Genetic variants of SARS-CoV-2, the virus responsible for COVID-19, can vary by transmission and immune escape capabilities [1].
 - The National SARS-CoV-2 Whole Genome Sequencing (WGS) Surveillance Programme began in December 2020, and has since then identified the circulating SARS-CoV-2 variants in Ireland.
- ## Methods
- COVID-19 outbreaks in Irish health and care settings during winter periods (October – May inclusive) were investigated.
 - Data was extracted from Ireland’s Computerised Infectious Disease Reporting (CIDR) System (29th April 2024) and processed using R version 4.3.2.
 - Waves were named according to the predominant SARS-CoV-2 variant in circulation (>50% prevalence) (Figure 1).

Results

- Highest average numbers of outbreak-associated cases and deaths recorded during the first two waves (Wild type and Alpha variants, Table 1).
- Comparatively fewer cases and deaths during the Delta wave following the roll-out of COVID-19 vaccination (Figure 2 and Table 1).
- Average weekly number of outbreaks also reduced following vaccination roll-out (Table 1).
- Of Omicron lineages, BA.1 & BA.2 variants associated with highest weekly average numbers of outbreaks, associated-cases and deaths.
- Scatterplots based on the numbers of COVID-19 outbreaks and outbreak-associated cases (Figure 3A), and deaths (Figure 3B) for SARS-CoV-2 variant dominant periods indicate outbreaks are influenced by dominant variants circulating.
- Outbreak-associated deaths have remained low since the roll out of the national COVID-19 vaccination programme (Table 1).

Conclusions

- COVID-19 outbreaks, associated cases and deaths in health and care settings were influenced by the dominant SARS-CoV-2 variant lineages and population immunity, resulting from either natural infection or vaccination.

[1] Carabelli et al., Nat. Reviews Microbiol. 2023

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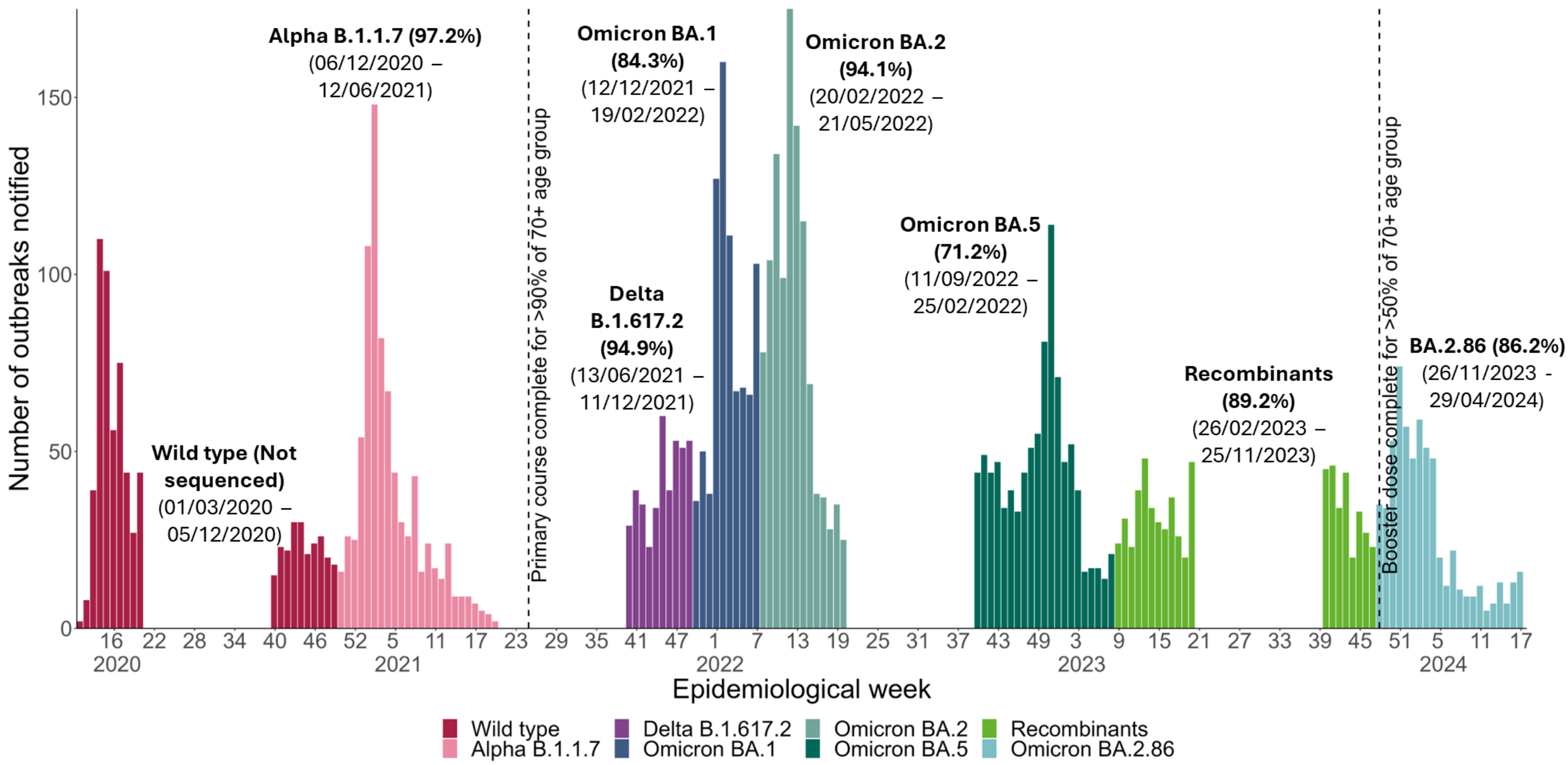


Figure 1. Number of COVID-19 outbreaks in health and care settings, 2020 - 2024

Table 1. Comparison of COVID-19 outbreaks in health and care settings during SARS-CoV-2 variant waves

SARS-CoV-2 variant	Outbreaks (N)	Average no. weekly outbreaks	Outbreak-associated cases*			Outbreak-associated deaths			Case Fatality Rate***
			Number	Average**	Median**	Number	Average**	Median**	
Wild type	735	18.4	12,722	17.3	5	1,314	1.8	0	10.3
Alpha B.1.1.7	809	30.0	14,281	17.7	8	1,572	1.9	0	11.0
Delta B.1.617.2	416	16.0	3,282	7.9	4	153	0.4	0	4.7
Omicron BA.1	826	82.6	11,512	13.9	7	241	0.3	0	2.1
Omicron BA.2	1,079	83.0	14,196	13.2	7	272	0.3	0	1.9
Omicron BA.5	929	38.7	7,415	8.0	5	105	0.1	0	1.4
Recombinants	659	16.9	4,529	6.9	5	47	0.1	0	1.0
Omicron BA.2.86	615	28	3,684	6.0	4	31	0.1	0	0.8
Total	6,068		71,621			3,736			

* Number of cases based on the larger among number ill, aggregate number of confirmed cases and number of confirmed linked cases.
** Average, median and case fatality rates based on all outbreaks per SARS-CoV-2 variant wave.
*** Case fatality rate calculated as percentage based on number of deaths/cases for all outbreaks per SARS-CoV-2 variant wave

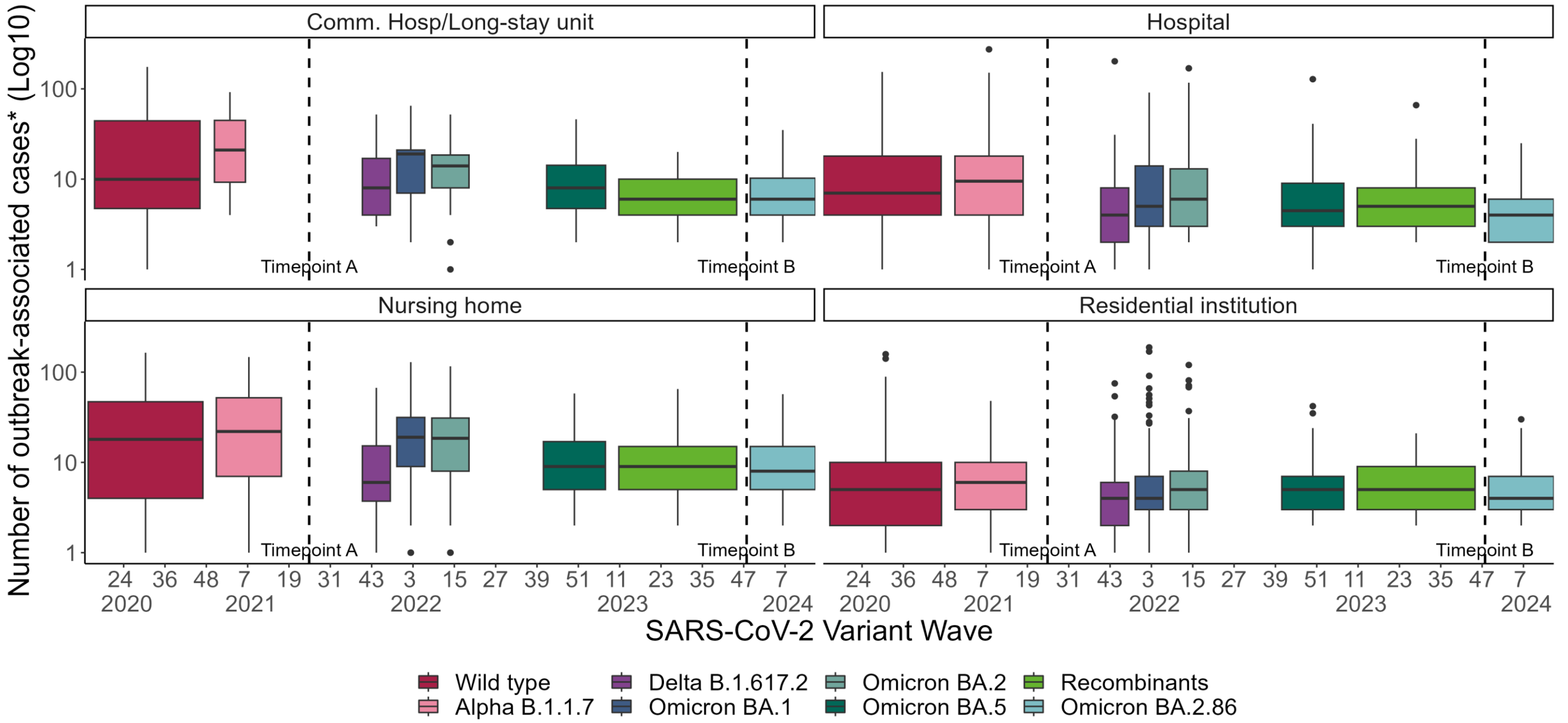


Figure 2. Number of outbreak-associated cases in health and care settings during SARS-CoV-2 variant waves. *Number of cases based on the larger among number ill, aggregate number of confirmed cases and number of confirmed linked cases. Timepoint A: Primary course complete for >90 % of 70+ age group. Timepoint B: Booster course complete for >50 % of 70+ age group.

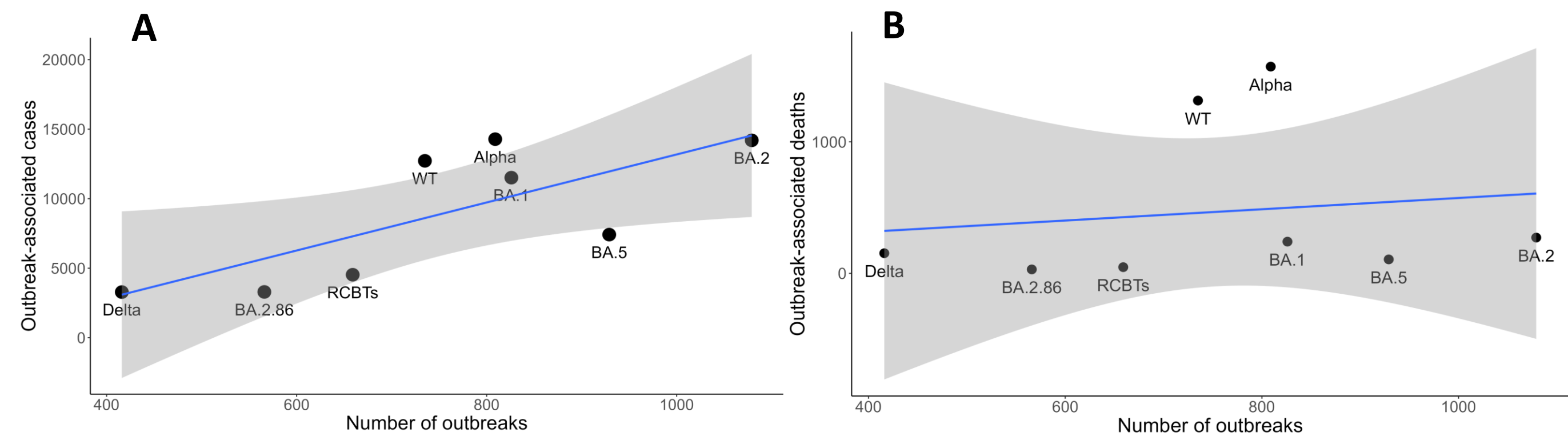


Figure 3: Linear relationships between the number of outbreaks and (A) outbreak-associated cases, and (B) outbreak-associated deaths during SARS-CoV-2 variant waves. Abbreviations: WT; Wild-type; Alpha; B.1.1.7, Delta; B.1.617.2, RCBTs; Recombinants



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