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National Centre for Infectious Diseases

Investigation of a COVID-19 Cluster in the Basement of a Local Hospital in Singapore from 30 August to 16 September 2021

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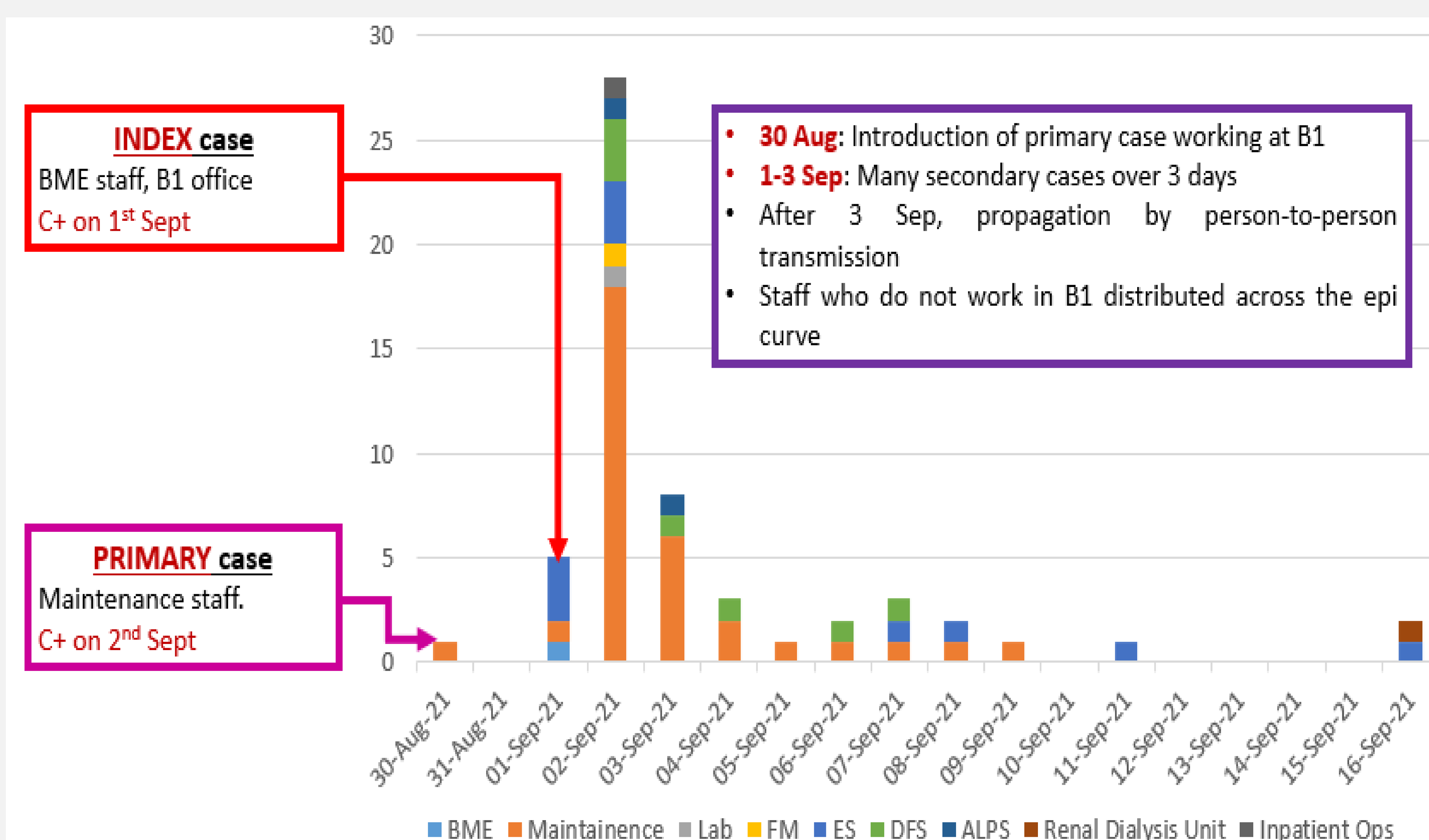
Background

- Primary case of the cluster developed symptoms on **30 August 2021**. (Figure 1)
- Symptom onset in **72%** of secondary cases occurred from **1 – 3 September.**
- Subsequent sporadic cases were identified **till 16 September**. (Figure 1)
- Of the **57** staff in this cluster, **6** did not work in the basement
  - Visited the basement or had social interactions with staff who worked there.
- All staff were **fully vaccinated** at the time of investigation.

Figure 1. Epidemic Curve showing onset of illness in CGH Staff with epidemiological and phylogenetic linkage (n=57)



Methods

- **Site visit** conducted to identify risk factors of transmission
- **CCTV footage** from the corridors and staff clock in/clock out areas was **reviewed**.
- **Interviews conducted** with selected staff to understand
  - Staff movements
  - Type & nature of interactions
  - Staff activities surrounding the time of the outbreak.
- Further details were obtained with assistance provided by in-house staff.

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- *Staff of CGH*

Results

- **58%** of those affected were **outsourced maintenance staff**
  - Substantial **time spent in common areas** such as workshop, rest area and male toilet likely caused **propagation of infection**
  - **Household transmission** was also likely as some staff lived together across 6 households in rented apartments
- Transmission to other areas in the basement
  - Visits by maintenance staff
  - **Poor ventilation** in basement
  - **Lack of safe distancing**
  - **Unmasked interactions** in crowded common areas
- 32 phylogenetically sequenced cases belonged to the **same parent node**, supporting findings from the investigation. (Figure 2)

Figure 2. Part of the phylogenetic tree showcasing selected cases from the cluster that were sequenced

Conclusion

- **Air and droplet, fomite and multiple mode exposures** accounted for the transmission of infection within this cluster
- **Poor ventilation** facilitated rapid spreading of infection

Recommendations

- Air handling unit (AHU) filters and exhaust mechanisms **upgraded to improve ventilation**
- **Increased disinfection** of common areas daily
- **Non-touch** clock in/clock out points introduced
- **Split team arrangements** to access high traffic points
- Improved **education**
- Enforcement of **infection prevention and control measures**
- Staff to be up-to-date on **COVID-19 vaccination**