

Maximising the efficiency of surveillance for COVID-19 in dialysis units in South Africa: The case for pooled testing

To the Editor: The COVID-19 epidemic in South Africa (SA) is currently in a growth phase with high incidences in most major cities.^[1] Patients who are dependent on chronic renal dialysis care, including peritoneal dialysis and haemodialysis, are chronically unwell and usually have multiple comorbidities including hypertension, diabetes and cardiovascular disease. These comorbidities are known to increase the risk of adverse outcomes for COVID-19, including hospitalisation with high care or intensive care admission, and/or death.^[2] Haemodialysis patients throughout the country require facility-based support three times a week, and a typical dialysis visit is ~4 hours.^[3]

Asymptomatic stages of SARS-CoV-2 infection necessitate the assumption that all staff and patients in a dialysis unit are potential carriers of the coronavirus or are vulnerable to infection.^[4] Viral shedding of SARS-CoV-2 includes expiration of infectious droplets and droplet nuclei that can be prevented by the use of face masks and other precautions including spatial arrangements and hand hygiene.^[5,6]

A holistic approach is necessary to reduce risks and mitigate consequences of SARS-CoV-2 infection. While screening checklists and temperature monitoring contribute to early detection in a dialysis unit, further monitoring techniques are necessary to identify staff and patients infected with COVID-19. In our current dialysis setting, we have found that some patients are unwilling to report mild symptoms, as this can result in the inconvenience of a delayed session and increased costs of testing as required by current triage recommendations.^[7] There is also the fear of stigmatisation associated with a positive test among staff and patients.

Testing all haemodialysis patients and unit staff at regular intervals may be helpful where COVID-19 tests are readily available and affordable. However, in SA, waiting times for results can currently be up to a week, and shortages of reagents are known to be a problem. Shortfalls in SA have been compounded by unfocused community testing and superfluous testing outlined in guidelines that are not well co-ordinated with SARS-CoV-2 risks and testing infrastructure.^[8]

Pooling samples from many patients and testing these pooled samples rather than conducting individual tests reduces test kit requirements. A recent simulation analysis has found that pooled-sample polymerase chain reaction analysis strategies will save substantial resources for COVID-19 compared with individual testing.^[9]

When pooling samples, the prevailing incidence and group size are considered, to determine most efficient fit in the epidemic context.^[10] Haemodialysis unit staff are already sorted into shifts and patients are already cohorted, providing initial strata for pooling. Current COVID-19 prevention protocols limit crossover between staff shifts and patient cohorts.

Pooled testing offers an affordable approach for COVID-19 surveillance of haemodialysis unit staff and vulnerable patients. As patients are at continued risk of COVID-19 transmission, multistage pooling is required.

We have been unable to find existing strategies on multistage testing at dialysis facilities, but would consider pooling of 5 staff or patients for inclusion into a single test based on current circumstances. This would be done in addition to daily symptom screening and temperature checks for staff and prior to the dialysis sessions for patients.

For the system to be effective, rapid turnaround of test results is necessary and can be achieved through engaging with laboratories to fast-track receipt of the data within a 24-hour processing window. Where a pooled sample tests positive, early intervention in isolating all contributors to the pool as well as testing the entire pool will be necessary. In combination with an appropriate sampling strategy, time- and cost-efficiencies are achieved in conjunction with the benefits of fast-tracked surveillance.^[9]

In summary, we recommend consideration of pooled sampling in dialysis facilities in SA to address test shortages and allow for rapid response strategies. For this system to be practical, an agreement is required between dialysis providers and funders around covering of costs and protecting patient interests, as well as co-operative arrangements with laboratories.

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