Serial Testing of Health Care Workers in Acute Facilities

2/12/2020

Action required:
☐ For noting
☐ For discussion
☒ For decision
1. **Background**

The HSE has developed a plan around protective measures for Health Care Workers (HCWs) in acute settings. This sets out the approach to testing including diagnostic testing, surveillance testing of admissions, periodic testing of selected patient groups and testing of HCWs identified as close contacts. This paper should be read in conjunction with the overall protective plan and is a more detailed outline of the proposed approach to serial testing.

This was considered by NPHET on November 5th which included proposals around the testing of HCWs in acute (hospital) settings. Specifically, the HSE Testing Strategy Working Group had initially made a recommendation:

> that all HCWs who work in settings that place them at high risk of being infected, or who work with, or near, patients deemed especially vulnerable to severe illness in the event of infection, should be tested serially on a fortnightly basis; subject to a testing capacity assessment.

Clearly there are many challenges in introducing such a programme into the acute hospital system. This paper has been developed by a working group comprising key clinical and operational leaders within the HSE by Acute Operations, Community Operations, Office of the Chief Clinical Office, Public Health and the National Testing & Tracing Programme.

Whilst the requirements for serial testing may change due to vaccine developments through 2021, this paper seeks to explore the strategic options available to implement a Covid 19 serial testing programme designed to ensure the health and safety of staff working in the Acute healthcare settings.

2. **Purpose**

The purpose of an acute hospitals HCW serial testing programme would be to provide a mechanism for the early identification of cases amongst asymptomatic workers to allow self-isolation and prevention of further spread of the virus amongst key workers and vulnerable patients.

3. **Objectives**

The objectives of the HCW serial testing programme are to:

- Understand prevalence rates of Covid-19 amongst asymptomatic HCWs
- Identify “at risk” staff groups that may require more frequent testing and/or IPC training
- Understand HCW participation rates and any barriers to inclusion
- Identify and deploy the operational requirements for a serial testing pathway
- Develop and deploy a clinical governance framework for Acute settings

4. **Challenges**

There are a number of high-level challenges which need to be addressed in order to implement a serial testing pathway for acute HCWs, which are summarised below:

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Description</th>
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<tbody>
<tr>
<td>Scale of HCW testing numbers</td>
<td>This is a large staff cohort with an estimated 75,000 working directly in the Acute sector spread across approximately 50 hospitals (not including clinical agency and other staff contracted by hospitals on a regular basis which could add an additional 10-15,000 personnel to be tested). For context, this grouping is double the size of the nursing home serial testing programme.</td>
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<tr>
<td>Impact on Symptomatic Testing Capacity</td>
<td>The timing for initiating testing for Acute HCW staff also presents a challenge as it would require diverting a significant proportion of the lab testing capacity to support asymptomatic testing at a time when modelling forecasts suggest that</td>
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<tr>
<td>Challenge</td>
<td>Description</td>
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<tr>
<td>Test modality</td>
<td>PCR based testing is currently the only testing method with proven efficacy and specificity, which is supported by an end-to-end process for reporting and contact tracing. RADT may provide some additional testing options for mass screening of HCWs, however, in the immediate term PCR based tests present the only viable testing option.</td>
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<tr>
<td>Operational Planning and Resources</td>
<td>To conduct swabbing on the scale required for Acute HCWs would require a significant number of trained resources and physical spaces dedicated on a full-time basis to swabbing activities in hospitals. Given the 24/7 nature of hospital services, out of hours swabbing and testing resources would also be required with challenges in using community testing resources and supplementing these. There will be an administrative burden for hospitals to setup all staff on swiftqueue for testing.</td>
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<tr>
<td>Staff acceptance of repeated testing</td>
<td>On-going serial testing of busy clinical staff who are asymptomatic and easy access to the service may emerge as a significant challenge over the medium term potentially impacting on the effectiveness of any serial testing programme.</td>
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<tr>
<td>Sustainability and opportunity cost</td>
<td>Ensuring the sustainability of a serial testing programme, particularly a programme based upon a hospital identifying and carving out resources from its own staff to undertake the associated swabbing and logistics is likely to deteriorate over time in its effectiveness. Similarl, for a range of services such as labs / occupational health services, etc., the opportunity costs of dealing with a high testing negativity rate (amongst asymptomatic populations) needs to be considered.</td>
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5. **Clinical Governance**

Public Health provides the clinical governance in other settings such as Nursing homes and in the food industry. Given the nature of acute hospital structures there are alternative options, such as the Hospital Occupational Health Doctor or the Hospital Clinical Director.

As part of the approach to serial testing of HCWs, a clinical governance framework will need to be developed to ensure appropriate clinical oversight of the testing process. Arising from the framework, each hospital group and hospital will have to implement a clinical governance system to ensure responsibility is clear for the serial testing programme. A clinical lead will need to be identified in each hospital, aligned to a specific clinical directorate that will take responsibility for HCW serial testing. Each hospital will also have interface with the employers of on-site contracted workers to ensure there are clear arrangements in place for contracted staff.

**R1:** It is recommended that a clinical lead, that Hospital Occupational Health Doctor where available, is identified in each Hospital Group and Hospital to provide clinical governance for serial testing.

6. **Testing Modality**

Existing serial testing programmes are conducted based on a PCR testing model with testing of participants being conducted on a fortnightly or four weekly basis. PCR testing is currently recognised as the only valid test for diagnosing COVID-19.

HSE have commenced a validation process for Antigen tests including procurement. Some initial purchases have been made in order to support a number of pilot studies and validations exercises in four sectors;

- Outbreak management
- Acute hospital HCW
- Food Industry
- Primary Care Testing Centres (symptomatic)

The findings from a number of validation studies are expected in mid-January. These will be critical in identifying the suitability of RADT for testing Acute HCWs and determining an optimal testing strategy for the sector. In addition, the IT test and trace infrastructure is not yet developed to support mass scale antigen testing.

Antigen tests are a better option for sustainable acute HCW testing, as they will not impact on symptomatic testing demand causing serial testing to be paused. The difficulty is that antigen testing would ideally operate on a shorter cycle of 4 days, which is not currently operationally feasible in most hospitals due to the scale of resourcing required.

PCR laboratory capacity is currently at c20,000 per day. A serial testing programme for all acute hospital HCW’s would result in an additional 5,000–7,000 tests per day based on a two-week cycle. NPHET modelling suggests that all of the 20,000 PCR test capacity per day and more will be required in Q1 2021. If PCR was the chosen modality then in the event of the community demand rising that the HCW serial testing programme could need to be reviewed very early in Q1 2021.

R2: It is recommended that PCR testing would be used for an initial round of Acute HCW testing and one Model 3 Hospital site would also be used for a parallel antigen validation study. Consideration should be given to a more staggered approach to protect PCR capacity and to enable a full assessment of antigen testing going forward as the test for serial testing.

7. Priority HCW Groups

Participation rates to date in serial testing have averaged around 70% (Food 67%, RCFs 72%). If this rate is applied to hospital staff, then an estimated 63,000 tests would be required. It is difficult to predict the likely take up of serial testing amongst acute hospital HCWs.

Where entire hospitals HCW have to be tested as part of an outbreak this has necessitated all staff being directed to the local testing centre, such as in Limerick and Letterkenny. This is due to lack of facilities and swabbing resources on the hospital campus. The view is that while staff may do this as part of the control measures for a wider outbreak, access will need to be on campus and easily accessible to ensure high participation rates in regular serial testing.

While evidence has been reviewed as to whether only specific HCW groups should be targeted there is not sufficient evidence to support a targeted approach at this point. Results from the antigen testing validation exercise and the sero-prevalence study among HCWs may provide additional evidence in this regard.

In addition to the contract and agency staff mentioned previously, decisions will also need to be made about the range of staff that attend hospitals each day but are not directly involved in patient care e.g. research staff and students from the various training disciplines.

R3: It is recommended that that all HCWs should be included in the first round of serial testing regardless of contract type until further evidence emerges on specific HCW risk groups.

8. Operational Planning

The key operational activities identified include:

Planning
- Development of the hospital serial testing management plan.
• Registering all staff within the hospital to ensure administrative details are correct for result reporting. Many hospitals do not have standing databases of all employees on site each day and a structured database system to manage this will likely be needed.
• Enhancement of OHS to process and respond to cases. Many hospitals do not have on-site OHS structures with services provided remotely or on a “number of days per week” basis. It is likely that there will have to be additional OHS resources deployed to all hospitals to respond and deal with arising monitoring and other issues from the serial testing programmes.
• Communications briefings to staff and stakeholders

Scheduling (Swiftqueue)

• Development of appropriate HCW testing information materials for circulation to staff; nursing home materials can be utilised.
• Scheduling HCW for appointments; This will have to done bearing in the mind the logistic requirement of the hospital (e.g. theatre staff can’t be scheduled during theatre time, large numbers of staff from the same ward can’t be called for testing, admin staff can’t be scheduled during OPD times, etc.). Scheduling of HCW appointments will also have to be aligned with in and out of hours services and also weekend staff.
• Scheduling of lab logistics/collections of samples
• Consideration of how to deal with staff who are currently symptomatic or are designated as close contacts.

Swabbing & Resources

• Recruitment of swabbing resources for acute hospitals; Hospitals will not be able to identify and secure enough swabbing resources to manage its own in-hospital HCW numbers. This will require the community swabbing centres and panels to be utilised on an extended hours basis. This is a significant challenge as all clinical personnel recruited are now deployed and panels comprise non-clinical staff with a greater training requirement.
• Identifying appropriate hospital facilities to undertake levels of swabbing required. In larger hospitals a number of dedicated facilities may be required (given staff numbers and physical size of hospitals).
• Recruitment of administrative support resources for scheduling and provision of results.
• Training of swabbing staff where required.
• We should trial less resource intensive alternatives such as self-swabbing and ward visits, as with the vaccination programme.

Protocols will need to be agreed on communication of results. These protocols will also need to make provision for a range of other staff types (e.g. agency workers, contractors, students, researchers, etc.).

Provision of appropriate space and swabbing resource presents a significant challenge for hospitals. In two of our largest hospital outbreaks, all hospital staff had to be directed to the local community swabbing centres, which were closed by as neither hospital had the physical infrastructure or swabbing resources. The risk to the acute HCW serial testing programme, if this model is deployed, is that participation rates may be lower where travelling to an off-site swabbing facility adds inconvenience and potentially queue time, if capacity is an issue where community prevalence rates are high.

Evidence from the establishment of previous serial testing programmes is that it requires a lead-in time of up to four weeks for each site to ensure all of the resources and operational arrangements are in place to ensure a successful programme. Additional lead-in time may also be required for other services who will be
providing support (e.g. additional Community swabbers) to identify these resources for the hospital serial testing programme.

Scheduling of hospitals should consider geographic factors to ensure testing is not concentrated in any one geography, possibly resulting in a number of hospitals in one area operating with reduced resource levels.

While nasopharyngeal swabs are used for other PCR testing, there is emerging evidence that the invasive nature of this swab impacts negatively on people’s willingness to engage with serial testing on a regular basis. Hence, it is recommended that the less intrusive nasal swab would be used for the acute HCW testing programme. It may also be possible to pilot a form of self-swabbing using nasal swabs to reduce the resource requirement and improve participation. This will be part of the first testing cycle and will also be considered as part of the antigen test validation study.

A number of resourcing decisions will need to be made in order to ensure sufficient swabbing and administrative support resources are available for hospitals to undertake a serial testing programme. This may require a combination of recruitment/agency/sharing of Community/NAS resources.

R4: It is recommended that the community test centre swabbing resources and additional recruitment panels are used to provide the necessary swabbing resources. This is contingent on symptomatic demand and recruitment.

R5: It is recommended that acute HCW testing be conducted on-site where possible to improve participation rates.

R6: It is recommended that in the first cycle a number of swabbing models be used, such as self-swabbing, to reduce the resource impact.

R7: It is recommended that a nasal swab be used to improve participation rates and to enable a self-swabbing model to be evaluated.

9. Hospitals to be included in the study

A number of options were considered to inform the development of a serial testing programme for Acute HCWs. These are outlined below:

a) All hospitals included
   Each hospital tested once over 8-week period to determine infection rates/high risk groupings etc. which would then be used to inform the criteria for an on-going testing programme.

b) Identify hospitals within specified risk criteria for inclusion
   Establish risk criteria and test all hospitals that fall within this for a minimum of two cycles. This would inform a wider serial testing programme, either option a or b above, and would also identify the operational challenges for hospitals.

c) Identify a number of different hospitals model types
   Select a mix of different hospital model types and geographies which would then undertake a cycle of testing with staff being tested 2 times. This would inform possible improved targeting of an acute HCW serial testing programme and enable the operational impact to be assessed.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Option A</th>
<th>Option B</th>
<th>Option C</th>
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<tbody>
<tr>
<td>Time to setup</td>
<td>High</td>
<td>Low/Medium</td>
<td>Low</td>
</tr>
<tr>
<td>% Staff tested</td>
<td>High</td>
<td>Medium/High</td>
<td>Low</td>
</tr>
<tr>
<td>Impact on resources</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Impact on lab capacity</td>
<td>Medium/High</td>
<td>Medium/High</td>
<td>Low</td>
</tr>
<tr>
<td>Complexity to implement</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
</tbody>
</table>
### Cost

<table>
<thead>
<tr>
<th>Cost</th>
<th>High</th>
<th>Medium/High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits (data provided)</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
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</table>

**R8:** It is recommended that a number of different Model (4/3/2) Hospitals be included in the first serial testing cycle.

### 10. Costs

The primary costs associated with introducing a serial testing programme are central administrative costs, swabbing costs and laboratory testing costs. The cost of PCR is also significantly higher than antigen testing.

Swabbing costs will depend on the model chosen i.e. use of community testing centres against recruiting swabbing resources directly into the hospital. Laboratory costs including swab costs are estimated at circa €100 per PCR test, so for example testing 90,000 HCWs every two weeks would cost €9m for each full testing cycle. Laboratory costs have reduced through recent negotiations but €100 is a useful benchmark when you include logistics and other associated costs. This excludes the additional administrative and swabbing resources required.

### 11. Options and Recommendations for Testing Acute HCWs

The following is a summary of the recommendations set out above that will inform the plan for acute hospital HCWs serial testing. It is recommended that:

- a clinical lead, the Hospital Occupational Health Doctor where available, is identified in each Hospital Group and Hospital to provide clinical governance for serial testing.
- PCR testing would be used for an initial round of Acute HCW testing and one Model 3 Hospital site would also be used for a parallel antigen validation study. Consideration should be given to a more staggered approach to protect PCR capacity and to enable a full assessment of antigen testing going forward as the test for serial testing.
- that all HCWs should be included in the first round of serial testing regardless of contract type until further evidence emerges on specific HCW risk groups.
- the community test centre swabbing resources and additional recruitment panels are used to provide the necessary swabbing resources.
- acute HCW testing be conducted on-site where possible to improve participation rates.
- in the first cycle a number of swabbing models be used, such as self-swabbing, to reduce the resource impact on the hospital.
- a nasal swab be used to improve participation rates and to enable a self-swabbing model to be evaluated.
- a number of different Model (4/3/2) Hospitals be included in the first serial testing cycle.

There are two key strategic options to advance acute hospital HCW serial testing at this time;

a) Defer serial testing for acute HCWs until the antigen validation studies are complete in order to consider if a full deployment of antigen testing could address the requirement, without impacting on PCR capacity entering into a critical phase of our disease response.

b) Commence a serial testing cycle for acute HCWs in a number of different Model (4/3/2) Hospitals using PCR testing, whilst conducting the antigen testing validation study in parallel in one of the selected hospitals.

The recommendation is to proceed with Option B. This however is based on the understanding that this may need to be reviewed in the context of priorities and capacity constraints, in the event that symptomatic referral increases significantly in Q1 2021.
Following completion of the first cycle of serial testing, an evaluation would then be conducted to inform the development of the next cycle of a serial testing programme, in combination with publication of the sero-prevalence study and completion of the Acute HCW antigen validation study this will enable consideration of:

- Possible risk stratification approach to staff groups and hospitals
- Operational model and impact on service continuity in hospitals
- Testing modality to be deployed for future cycles, PCR and/or Antigen

12. Next Steps

The proposed timeline for implementing Cycle 1 for HCW serial testing (subject to NPHET approval) would be based on the following milestones:

- NPHET approval of HSE recommendations regarding Acute HCW serial testing approach - Dec 3rd
- Identification of participating hospitals – Dec 5th
- Enabling & setup activities complete (3 weeks) – Dec 24th
- Testing cycle begins – Jan 4th (testing during holiday period not recommended)
- Testing complete – Jan 22nd
- Evaluation Report – Jan 28th

The above timeline is contingent on engagement with the specific hospitals selected to ensure that they can implement within these timeframes and community operations on the provision of resourcing from community swabbing centres.