Coronovirus mass testing strategy

Output from the Downing Street testing workshop.

This note outlines the four-pronged approach to massively increase the number of coronavirus tests each day.

Our **mission** is to save lives and enhance the capacity of the NHS, and mass testing can play an important role.

Our **objectives** for mass testing are to (1) protect lives by keeping coronavirus away from sensitive areas with vulnerable people like hospitals and care homes, (2) to provide clinical and social care staff with clear guidance on whether they are contagious so we can use our scarce human resources efficiently, and (3) to provide ordinary people suffering symptoms with a simple test to tell whether they are carrying the virus or not ("isolate, or not?"), or confirmation that they are now immune so they can continue with their daily lives ("back to the pub!").

Our **approach** to scaling our testing arrangements is to use a range of scientific methods (such as antigen and antibody testing) and partners (from British biotech firms, global tech companies, Chinese manufacturers, and high-street retailers). We will be based on the science of PHE and MRHA, and embrace the energy and innovation of the private sector.

We will use a mixture of antigen testing, which can detect immediately whether someone currently has the virus, and antibody tests, which can detect whether someone has immunity and is therefore uncontagious (though not whether they currently have the virus).

We have agreed a four-pronged approach.

1. Increasing the NHS lab-based testing capacity from 5,000 per day to 25,000 per day.

It is essential we protect frontline staff and patients by testing so that we can exclude those staff carrying the virus, and prioritise patients who develop the virus.

This workstream will be driven by **Professor Sharon Peacock** (Director, National Infection Service), working through PHE and NHSE, and will focus on providing, in the next couple of days, 5,000 extra tests per day at the existing install base of machines at places like Blood Banks and hospital laboratories. The objective will be to work with Roche (the Swiss healthcare corporation), suppliers of reagents and other partners to take this number to 25,000 in the near term.

These are highly-reliable tests from a proven, qualified provider with existing machines on site at hospitals which are already plugged into the Laboratory Information Systems. It makes sense that this high-quality, ready-to-go facility is focused on testing high-priority targets within the NHS system suchas (1) people in ICU with pneumonia, (2) people who are sufficiently unwell who are admitted to hospital with pneumonia, (3) to support outbreak investigations, for example highly targeted testing in schools and social settings and, if spare capacity, (4) for key workers at the discretion of individual NHS Trusts.

MHRA will publish the specifications of this system, including testing kits, commercial terms, reagents and IT arrangements, so that potential partners can easily make offers to augment the supply. Steve Oldfield at DHSC, supported by the Lord Agnew's Cabinet Office commercial team, will assist in the procurement arrangements.

2. Extend our national mass population surveillance

There is huge value to understanding the demographic progress of the virus so that we are armed with the intelligence of how quickly it has progressed, and to arm our epidemiologists and statisticians with the data necessary to understand the virus. Surveillance is already in place, but these needs to be upgraded to provide the data we require and they need to use the latest and most accurate serology tests.

Professor Sir Jeremy Farrar, Director of the Wellcome Trust, will drive this workstream.

3. Mass-market testing for ordinary people using pregnancy-test-style pin-prick blood tests.

There is an exciting opportunity to use the latest mass-manufactured Covid-19 antibody tests from China, which have been used by the Chinese government to impactful effect. These are based on a blood prick to obtain a drop of blood to detect antibodies, which are detectable two weeks after the infection has occurred. It will look like a pregnancy test and be read like a pregnancy test. These may be a valuable, affordable and easy-to-use tool for home testing supplied with an easy-to-administer return path to the NHS by high-street pharmacists like Boots and online retailers like Amazon.

Certain regulatory and practical hurdles remain as it is passed by the Chinese FDA, but not yet by recognised regulators, and then only for commercial rather than retail use. However, we understand the Chinese government has made effective use of such tests and we are determined to figure out the opportunities.

This is an antibody test so it cannot reliably say that someone has not got the virus, so cannot be used to safeguard frontline staff or patients. But it can tell whether someone has had the virus and therefore is now uncontagious which means they can return to normal life.

Delivering millions of tests a month which also connect with the NHS patient files will require an ambitious collaboration between testing companies, retailers and technical solution partners. **Hadley Beeman**, Chief Technology Adviser to the Secretary of State, will be responsible for delivering this workplan.

4. Urgent and specific antigen testing for protecting frontline staff and maximising our workforce.
There is an urgent need for massively expanding our capacity for reliable antigen tests so that we can create a fast-track route back to work for frontline staff who face the dilemma of weeks of self-isolation if they may have symptomatic family-members at home, but are much needed at work.

This needs to be outside the conventional NHS structures, which are already stretched by existing demands, and off-site the NHS estate, as they will be testing potentially contagious people. There needs to be a beginning-to-end solution, from the appointment process through to the result notification. The approach will be to embrace innovate and disruptive solutions.

ThermoFisher, the US-based provider of scientific instrumentation, has capacity for delivering 100k tests per week, dependent on the availability of certain reagents and capsules which may require an industry-wide approach to procurement. We need to wrap a delivery solution around these tests which can be swiftly deployed by a suitable partner. Since the existing testing machines are based in many of Britain's 120 universities, the draft plan is to look at a drive-in solution at university car-parks where there is often an availability of space for testing stations, parking, administration and scientific equipment. **Kristen McLoed,** Director of the Office of Life Sciences, is leading this workstream with scientific support from PHE.