Innovative Technologies to fight the coronavirus

(Distilled from an in-depth analysis of the European Parliamentary Research Service, April 2020)

1. Artificial intelligence is changing the way disease outbreaks are tracked and managed, thereby saving lives. From being used in lung scans to processing vast amounts of date in open-sourced data platform, AI has become a vital tool to combat diseases. Furthermore, it is predicted that AI will reduces the time it takes to develop vaccines and test them considerably.

2. Blockchain applications in addressing covid 19 are emerging with the promise to keep data secure and updated, hundreds of times a day. Blockchain tech can provide robust, transparent and cheap means of facilitating effective decision making, managing insurance and other payments online, maintaining the sustainability of medical supplies, etc.

3. Open-source technologies – a multitude of repositories and information technologies platforms have seen the light of the day to help addressing the pandemic, often coordinated by WHO and by national centres for disease prevention and control. At the same time a large number of bottom-up, open data initiatives and open-source project have been developed in response to the pandemic.

4. Telehealth applications are helped providing medical health services in remote places and in locked in situations through e.g. video-visits. Several telehealth companies have developed on-line symptom checkers to screen patients and improve effective triage prior to hospital admission.

5. Three-dimensional printing can help boost production and optimise the supply of necessary medical equipment. 3 D printing is an additive manufacturing technique at low cost from ventilator valves to face mask clasps to test kits.

6. Gene-editing technologies (CRISP technology). The disclosure of the genetic code of Covid 19 has shed light on the origins and spread of the disease and points out to potential pharmaceutical targets for drug development. There are at least 20 coronavirus vaccines currently under development.

7. Nanotechnology – a multidisciplinary field that makes use of nano-sized particles and devices for various applications including diagnostics, targeted drug delivery, and the production of new therapeutic materials. Several applications are in advanced stage of testing. For example, a nanoparticle-infused fabric can be used in medical masks, protective clothing and hospital materials, and multilevel antimicrobial polymer (MAP-1) coating can be effective in killing viruses, bacteria and even hard-to-kill spores, which could provide lasting protection against microbial contamination to public venues.

8. Synthetic biology = using a multidisciplinary approach involving biology, engineering, genetics, chemistry, and computer science to substantially alter the genotypy of the viruses. In the case of corona synthetic biology is used to speed up the development of a vaccine, e.g. through using synthetic versions of the virus.

9. Drones are being used in the covid pandemic for disinfecting, street patrols, and food and medicine delivery. They can help reinforce restrictive measures, boost disease detection and crowd management, but also open doors to pervasive surveillance and overstretched law enforcement.

10. Robots have been used to provide services and care for those quarantined, to disinfect hospitals, handle biohazardous waste and deliver food and medication – in that way reducing risks from person to person transmission.
11. And then of course all the "normal" technologies such as CT scanners (and CT in a box), ventilators, X-ray machines, ultrasound etc – many with improved efficiency due to incorporating AI.

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