**Supplemental materials for**

**Supplemental Appendix 1**. The description of traffic light used in China
Green= no restrictions.
Yellow=must quarantine at home.
Red=must quarantine at centralized isolation places for isolation medical observation.

**Supplemental Appendix 2. Semistructured interview questions for PCPs and patients**

| PCPs |
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| 1) What do you know about DDS? |
| 2) What does DDS mean to you in your professional role? |
| 3) Please tell me some examples of using DDS in your current clinical role. |
| 4) How do you think about using the DDS to manage infectious diseases, such as COVID-19? |
| 5) What specific ethical or safety issues/ concerns you might have on using DDS to manage infectious diseases? |
| 6) How do you think that your patients' eHRs would be extracted, managed, shared and governed? |
| 7) How might you communicate with patients on eHRs being used for DDS? |
| 8) What specific ethical issues do you think when it comes to sexually transmitted diseases or HIV/AIDS? |
| 9) What do you think of oversight of the DDS for ID management from organizational level or policy level? |
| 10) What do you think about the epidemic control situation between China and neighbouring countries? |
| 11) How might Chinese government policy further contribute to the ethics of using electronic health records (eHRs) for using DDS to manage infectious diseases? |
| 12) Any other recommendations on our study's surveillance system to address those ethical issues? |

| Patients |
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| 1) Have you heard of DDS? What might this mean to you? |
| 2) Please tell me how you see DDS being used in your daily life. |
| 3) Please tell me how you see DDS being used in COVID-19 pandemic. |
| 4) What are the benefits/ challenges to using DDS for detecting and monitoring infectious diseases occurrence? |
| 5) Have you experienced eHRs? What do you know about electronic health records (eHRs)? |
| 6) How do you think your eHRs should be managed and by whom? Who should have access to these records? |
| 7) What are your concerns about your eHRs accessed by DDS for infectious diseases surveillance/ early warning? |
| 8) Are there any specific ethical/ safety/ privacy/ personal identifiable information issues you want to raise up? |
| 9) What specific ethical issues do you think when it comes to sexually transmitted diseases or HIV/AIDS? |
| 10) What do you think of oversight of the DDS for ID management from organizational level or policy level? |
| 11) What do you think about the epidemic control situation between China and neighbouring countries? |
| 12) Do you have any other recommendations for addressing these ethical issues? |

**Supplemental Table 1.** The codebook and definitions

| Themes | Codes (PCPs) | Codes (patients ) | Definitions |
|---|---|---|---|
| **1. Potential impacts on trust and informed consent** | 13. There is a certain distrust for hospital or government to manage personal data and protect privacy<br>19. Trust government and government in-charged hospital | 15. Trust hospitals or government to extract personal e-health information<br>22. Worried about private data disclosed with informed consent | • The extent to which an individual can restrict and control how organizations use and disclose their personal information.<br>• The extent to which an individual can have confidence that the parties who have access to their data respect the individual's rights.<br>• The extent to which an individual mindfully consents to what data organizations collect about them and how they use it. |
| **2. Need for autonomous decision-making** | 22. The implementation of health code is compulsory<br>10. The quarantine policy is compulsory | 41. The implementation of health code is compulsory<br>21. The quarantine policy is compulsory | • The extent to which an individual can freely make choices without being unfairly discriminated against or constrained by the use of big data analytics.<br>• The extent to which a dominant group, organization, or government uses big data analytics in a way that imbalances power in society. |
| **3. Potential discrimination associated with ID in China** | 27 Public fears of infectious disease lack of awareness of infectious diseases in the public | 39 Infectious disease is a risk | |

| 4. Risk of inequity and divided care | 9 Certain group of people will be impact by DDS | 21 Vulnerable population can not use DDS | • The extent to which an individual mindfully consents to what data organizations collect about them and how they use it.<br>• The extent to which an individual can freely make choices without being unfairly discriminated against or constrained by the use of big data analytics. |
|---|---|---|---|
| 5. Health data security: Whose responsibility is it? | 11 Cross border cooperation in epidemic prevention and control is difficult to guarantee<br>6 Cross-border sharing must ensure that every link in the implementation of the software and hardware system is implemented<br>12 Transnational data sharing requires WHO to play a coordinating role | 25 There should be international legal supervision<br>14 International departments should establish a management system | • The extent to which organizations have values, norms, and shared beliefs (informal governance) together with standards, decision rights, and responsibilities (formal governance) that promote ethical big data analytics practices.<br>• The extent to which organizations observe, monitor, measure, and profile individuals' lives in a society. |