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Supplementary to SPI0020

1. While we send out a sample collection kit to community settings, such as venues and dormitories at the University of East Anglia, the actual testing strategy we use does not involve a drug testing 'kit'. The samples are returned to us for analysis using a full, laboratory-based toxicology screening service. Our kit is similar to Police early-evidence kits, and only contains the components needed for collection of the samples. The analysis, as with Police samples, involves full toxicology screening using high-tech analysis. Our analysis is performed using a technology called quadrupole time-of-flight mass spectrometry (Q-ToF-MS), which offers both high sensitivity and specificity in drug-detection. Q-Tof-MS is an established technique across the fields of pharmaceutical and biological research, including metabolite analysis and drug discovery, and offers comprehensive drug screening to the field of toxicology.

2. Substances present in a sample are analysed first by separating those substances at the molecular level, using a technique called liquid chromatography. Once separated, the molecules of each substance enter the Q-ToF-MS, where they become electrically-charged. These then enter the 'flight chamber', a vacuum tube with an electrical field applied across it, where they are separated further on the basis of their mass and charge.

3. As if on a racetrack, the smallest, lightest components reach the 'finish line' first (i.e. the mass detector), while the heavier, slower components take longer. The time taken for the molecules to reach the finish line is directly related to their molecular mass, and thus their identity. Using this technology, we can robustly identify in excess of 1,600 substances. We have been using this method to screen drug samples clinically, and whilst common in forensic toxicology services, it is found in relatively few hospital laboratories. Until recently, we have also been using this method for post-mortem investigations, to identify substances a person may have taken prior to their death. With our laboratory screening initiative for suspected spiking incidents, we are currently offering participants their full toxicology Q-ToF results within four working days.

4. We do not include any drug testing devices in the sample collection kits to use in situ, such as at the venues, as these devices are beset with difficulties, such as cross-reactions, false negatives, and unreliability when used improperly. Since we do not want to include any kind of drug testing that could produce an incorrect result, we have avoided such devices at this stage. We have designed the kits to facilitate laboratory analysis, without a request needing to go through a doctor, allowing anyone who feels they may have been spiked direct access to advanced technology, and robust and comprehensive toxicology screening, usually only

available through clinical requests (or in post mortem/forensic investigations). This circumvents the need for formal requesting, enabling a faster turnaround time. Whilst we are working closely with the Police on this, they would still require their own forensic samples for criminal investigations. This is a scheme for those who 'may not be sure' if they have been spiked, so we can build a picture of the prevalence of spiking and the substances being used.

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