Comparison of breath-guard and face-masks on droplet spread in the eye clinic

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Introduction

The COVID-19 pandemic has had a huge impact on eye care delivery. One of the saddest aspects is the number of patients that were infected within hospitals and subsequently died. Understanding the risks of infection within the eye service is essential to keep our vulnerable elderly patients safe. Measuring droplet spread is very difficult as aerosol meters do not work in clinical environments. The 2m rule was derived on theoretical calculations (Wells 1943); that droplets would fall to the ground by 2m, or evaporate.

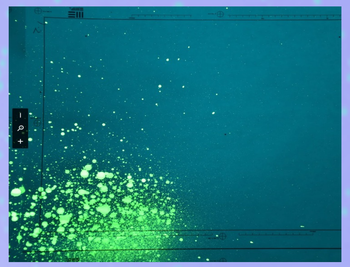


Methods

We used fluorescein-stained saline within a calibrated 'cough model' to measure the propagation of droplets within the eye clinic.
The droplets were ejected and landed on calibrated paper targets, imaged under UV light and analysed at the University of Portsmouth Institute for Cosmology and Gravitation.
We compared: face-masks and breath-shields vs control within eye clinics.
Experimental set up. Note calibrated targets attached to a board.



Results

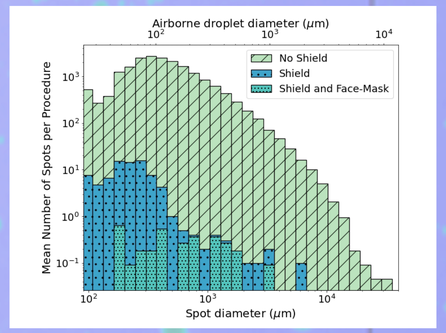


Control



Breath-Guard + Face mask

The average number in the control was 19,430 droplets , in breath-guard alone was 80 droplets and combined with face mask was 2 droplets (P<0.01).



Conclusion:

Ophthalmologists are uniquely vulnerable to air borne diseases. Combining breath-guards and face-masks virtually eliminates droplet spread to clinicians.