Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Journal of Clinical Virology 129 (2020) 104449

Contents lists available at ScienceDirect

Journal of Clinical Virology

journal homepage: www.elsevier.com/locate/jcv

The utility of beta-2-microglobulin testing as a human cellular control in COVID-19 testing

Effective responses to the COVID-19 pandemic are dependent on correct information provided by accurate diagnosis. Poorly taken clinical samples can result in false negative tests resulting in misinformed decisions. To address this, we at the Public Health England laboratory in Manchester have used beta-2-microglobulin as a marker of human cellular control alongside COVID-19 testing (RpRd gene; Roche FLOW system) [1,2]. Samples failing the control and testing negative for COVID-19 were reported as inadequate thereby ensuring samples with no human tissue present were not reported as true negatives.

From 11/02/2020, 15,485 respiratory tract samples have been tested (Fig. 1). A total of 241 (1.6%) samples were human cellular control failures, all of these were swabs of the upper respiratory tract. We note that 'Nose and Throat' swabs and 'Throat' swabs failed the cellular control more commonly than 'Nasal swabs' alone (1.7%vs 0.7% $p = < 0.01$ chi squared) and samples failing the cellular control had a significantly lower proportion of positive tests for COVID-19 than those which passed (11.6% vs 5.4% $p = 0.02$).

These findings show inadequate sampling as measured by human cellular control is a phenomena confined to swabs and that throat swabs were the most frequent poorly taken sample. This information is highly pertinent to health care practitioners collecting clinical samples and reinforces the need for correct sampling technique. Secondly, the significantly lower proportion of COVID-19 detection in those failing the human cellular control suggests some samples only failed to detect the virus because of inadequate sampling, without the human cellular control these results would have wrongly been reported as negative.

We surmise human cellular control testing has an adjunctive role in ensuring quality sampling and test accuracy. Though the control does not fully ensure the sample is correctly taken, it is instructive and reassuring to those collecting samples. Most importantly, we evidence a reduction in the possibility of false-negative results and the inherent potential for ongoing harm that could result [3]. We are also pleased to acknowledge that only a minority of our samples were cellular control failures meaning poor sampling is uncommon in our population. If generalisable, our findings indicate poor sampling is not a major contributor towards the high numbers of false negative results reported [4]. We would like to commend and encourage the continued good practice of frontline staff.

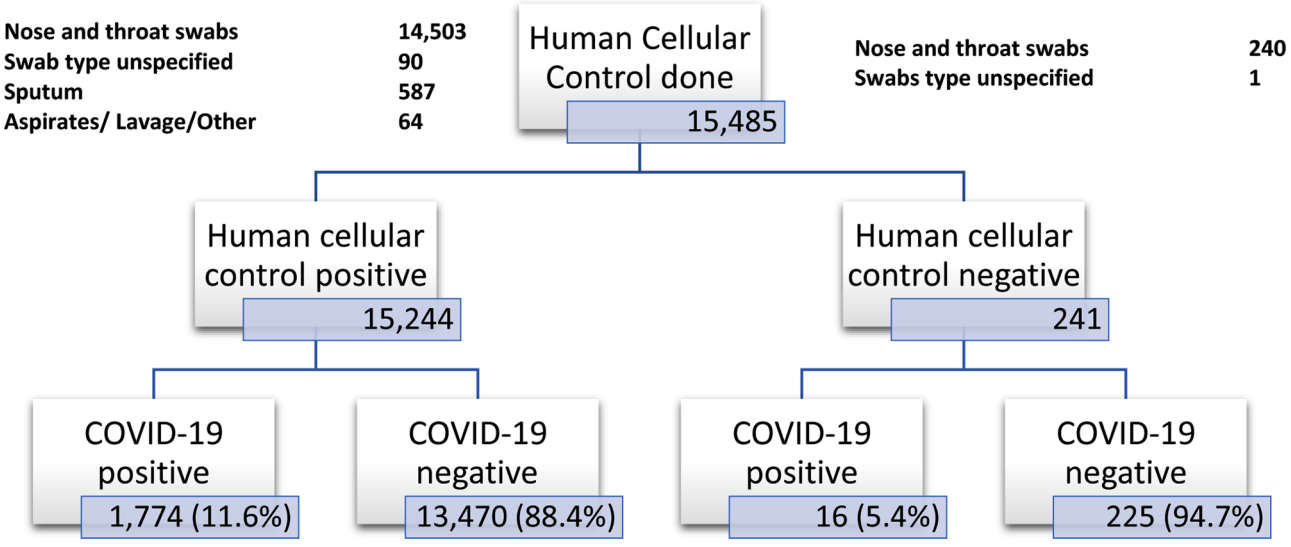

Fig. 1. the use of Beta-2 –globulin Human cellular Control at Central Public Health England laboratory Manchester.

https://doi.org/10.1016/j.jcv.2020.104449
Received 13 May 2020

Declaration of Competing Interest

None.

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