

Journal Pre-proof

Social media for field epidemiologists (#SoMe4epis): How to use Twitter during the #COVID19 pandemic<ce:footnote id="fn0005"><ce:note-para id="npar0005">In line with the topic of this article, we use hashtags (#) and Twitter accounts (@) throughout the text where available and appropriate. We invite readers to check out these hashtags and accounts, which we have found to be some of the most informative and engaging in the field.</ce:note-para></ce:footnote>



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Perspective:**Social media for field epidemiologists (#SoMe4epis): How to use Twitter during the #COVID19 pandemic¹**

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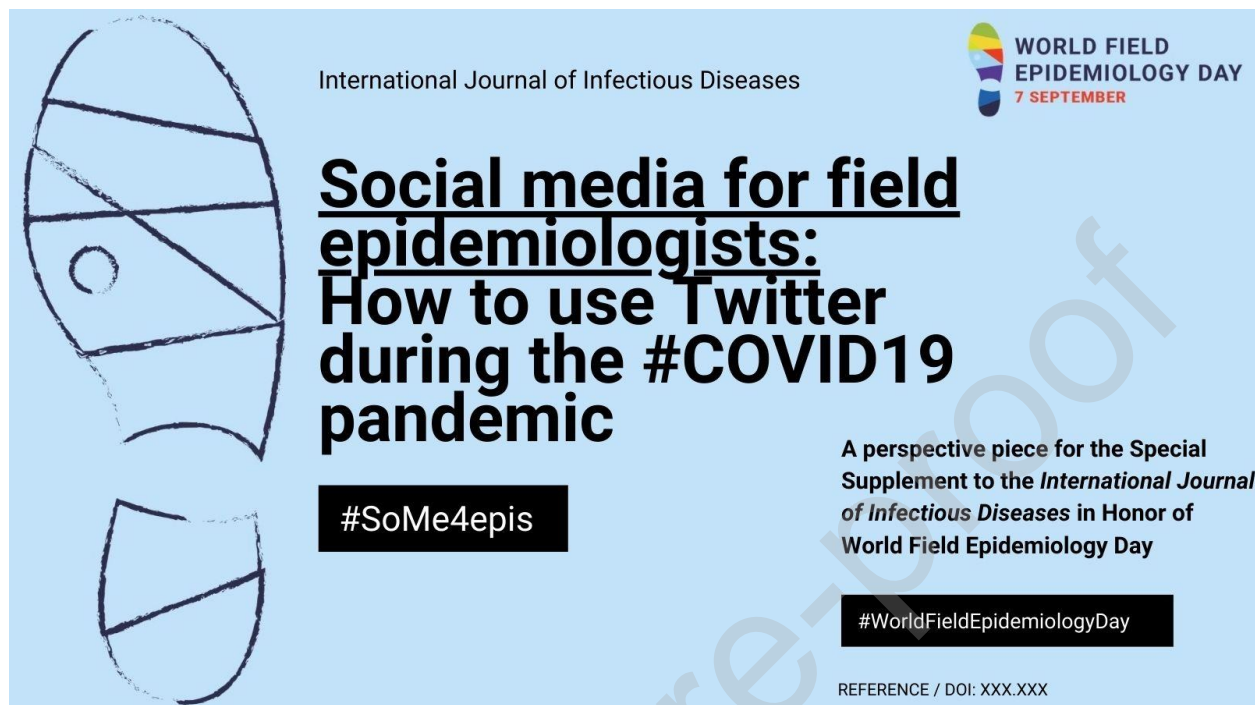
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Graphical abstract

**Highlights**

- COVID-19 is the first pandemic in the social media age.
- For the first time field epidemiology includes an online field.
- Social media can be a powerful tool for field epidemiologists.
- Key usages of Twitter include: science communication and professional development.

Abstract (186 words)

The COVID-19 pandemic has fundamentally changed the way that public health professionals work and communicate. Over a very short time span, remote working arrangements have become the norm, and meetings have shifted online. Physical distancing measures have accelerated a trend toward digital communication and social exchange. At the same time, the work of epidemiologists has been held under a magnifying glass by journalists, governments and the general public, in a way not

previously seen. As social media have become an inevitable part of our society over the last decade, Twitter has become a key communication tool and platform for social networking among epidemiologists (#EpiTwitter). In this article we reflect on the use of Twitter by field epidemiologists and public health microbiologists for rapid professional exchange, public communication of science, and professional development during the pandemic, as well as the associated risks. For those field epidemiologists new to social media, we discuss how Twitter can be used in a variety of ways, both at their home institutions and during field deployment. These include: information dissemination, science communication and public health advocacy, professional development, networking and experience exchange.

Key words: Social Media; Online Social Networking; Scholarly Communication; Communications Media; Public Health; Epidemiology

Introduction

The Coronavirus Disease 2019 (COVID-19) pandemic has become the first pandemic to take place in the social media age. Whilst the pandemics of Severe Acute Respiratory Syndrome (SARS) in 2003 and Highly Pathogenic Avian Influenza H1N1 in 2009 (Chew and Eysenbach 2010) made headlines around the world, they ran their course in a world very different from the one that is now seemingly collectively experiencing in real-time the COVID-19 pandemic including the corresponding infodemic (Cinelli, Quattrociochi et al. 2020). Social and digital media in their current form were unknown

during these two pandemics and information was consumed predominantly through traditional media outlets in print, television and radio.

Social media are now an integral part of our society. Facebook was launched in 2004 with Twitter, WhatsApp and Instagram following in 2006, 2009, and 2010 respectively. In the last quarter of 2020, Twitter alone had 192 million daily, active users (Statista 2021). Despite social media already being well integrated in society during the Ebola Virus Disease epidemic in West Africa in 2014, and having played a role during the Zika pandemic in 2016 (Dredze, Broniatowski et al. 2016, Kadri and Trapp-Petty 2016, Chan, Winneg et al. 2018), the global reach of the COVID-19 pandemic coupled with the steep increase in social media use in the last few years, has made it an altogether different experience (Merchant and Lurie 2020, Merchant, South et al. 2021, Tsao, Chen et al. 2021).

In a very short time span, COVID-19 has fundamentally changed the way that field epidemiologists work, with remote working arrangements becoming common and meetings having been shifted online. Physical distancing measures have pushed this balance to even more digital communication and social exchange. Social media are not only being used by journalists, governments and the general public, but also by those directly responding to the pandemic. Public health professionals are now using social media to survey public attitudes, to manage the infodemic, to assess mental health, detect or predict COVID-19 cases, analyse government responses to the pandemic,

and evaluate quality of health information in prevention education videos (Tsao, Chen et al. 2021).

Twitter for public health professionals

In this perspective, we reflect on the use of Twitter by professionals working on the COVID-19 response (#SoMe4epis), and introduce the field of social media to those not currently using social media in their public health practice. We have focused on Twitter for this perspective. While many field epidemiologists use a variety of social media platforms, Twitter has become not only an important news outlet and platform for communication but also for professional development activities, ranging from knowledge acquisition and peer-learning to applications of skills in science communication and the reflection thereof. Digital platforms such as Slack and WhatsApp are used daily by responders to the COVID-19 pandemic however, their use is often limited to information exchange and networking in semi-closed established groups. They can therefore be seen more as part of the digital work infrastructure and less in their function as social media. Alternatively, the World Health Organization has launched WhatsApp² and Facebook messaging services in seven different languages, to directly inform the general public. National governments in for example the United Kingdom and Germany have launched similar services through chat bots on WhatsApp and Telegram. Facebook and Instagram on the other hand, in our experiences, are used primarily in a personal capacity, or for pushing public messaging by main public health institutions. However, overlap between users and messaging, and cross-platform use of

² URL: <https://www.whatsapp.com/coronavirus/who/?lang=en>

communication is one of the key strengths of social media, as an extension of traditional media such as radio, newspapers and television.

Twitter can be used in a variety of ways by field epidemiologists, both at their home institutions and during field deployment including information dissemination, science communication, professional development, and networking and experience exchange. These varied ways to use Twitter are in no way mutually exclusive and often the reason for using social media; even for a single tweet (i.e. a micro-blog posted on Twitter) covers more than one of these usages. In most cases, any professional interaction on Twitter by field epidemiologists during this pandemic covers all aspects, which is one of the unique values of engaging on Twitter as a scientist. However, not all public health Twitter use is, or should, be though active engagement. In fact, in our experience many public health professionals start by following and reading other users' tweets, actively engaging only at a later stage (or never).

Science communication (#SciComm) and advocacy

Twitter allows for science communication between peers as well as with the general public and journalists, by either amplifying official information or producing original content. Conversely, social media have also opened other avenues for coproducing information between scientists and citizen scientists who represent and share scientific content such as surveillance data for a general public audience. Communication between scientists serves the purpose of transparently strengthening official information provided by the institute or organisation at which the individual is based, and/or that of

an accepted international or national authority such as the World Health Organization (@WHO) or the European Centre for Disease Control and Prevention (@ECDC_EU). Information can be shared by retweeting content from the organisation and their key staff, such as for example the Executive Director of the World Health Organization's Health Emergencies Programme Mike Ryan (@DrMikeRyan) and the COVID-19 Technical Lead Marie van Kerkhove (@mvankerkhove). Furthermore, press conferences by for example public health institutes, are often live-streamed on a plethora of social media platforms, allowing for swift communication and direct engagement. One striking example of this would be the press conference on the investigation of the AstraZeneca COVID-19 vaccine and thromboembolic events by the European Medicines Agency (European Commission [@EU_Commission] 2021).

Beyond this, field epidemiologists using Twitter also directly share information and hands-on experience as individual experts, without specifically amplifying official information for any organisation or accepted authority. As ambassadors of their profession, communicating key epidemiological concepts that are the talk of the day are valuable ways to communicate science for community engagement. One example is the “#CatteningTheCurve” graph (Figure 1) posted by the epidemiologist Dr Darling (@amdar1ng), who found the perfect cat-metaphor for the ‘flatten the curve’ message (Darlin AM [@amdar1ng] 2020). In addition, the “Swiss cheese model” adapted for COVID-19 by Dr. Ian M. Macay (@MackayIM) (Figure 2A) that builds on the original “Swiss cheese model” of accident prevention (Reason, Broadbent et al. 1990, Mackay I [@MackayIM] 2020), has been an excellent explainer of how multiple non-perfect non-

pharmaceutical interventions can be very effective when applied as a package.

Because of social media, the visualization has been translated quickly by the online community, to many different languages. Moreover, it has been adapted by official institutes as well: the Irish public health institute even implemented this in its official communication material (Figure 2B) (Holohan T [@CMOIreland] 2021).

Furthermore, journalists search news content and experts through Twitter. Having an online presence increases your 'findability' and increases the reach of your work and findings. Sharing your work and experience on Twitter helps journalists to find you, your work, and your expert view on current issues. Twitter is very good for news article "peer-review", and can help to quickly clarify false information or misinterpretation of science in mainstream media, which has not uncommon during the COVID-19 pandemic. Importantly, these communications can often lead to invitations for follow up in traditional media, such as radio, newspapers and television programmes.

Rapid 'in action' professional development & networking

Analogous to providing expert information to the general public, field epidemiologists also share the latest and developing evidence with each other and other scientists and clinicians. This covers both emerging evidence generated by the user herself, for example in operational research projects, but also highlighting and discussing evidence and papers by other scientists and researchers. Using Twitter for professional development allows for the rapid acquisition of new and evolving knowledge, which is engaged with through synthesis and translation into focused key messages.

Additionally, Twitter is a powerful tool for linking new and ongoing research and researchers, facilitating rapid knowledge exchange as an extension of traditional peer-review. The function of building “threads” (i.e. multiple linked Tweets) allows for more extensive explanations and content beyond what would be possible in a single Tweet.

Another important function of using Twitter in the context of the COVID-19 pandemic is networking and the exchange of experience. The community of epidemiologists on Twitter is found through the hashtag #EpiTwitter, as well as the specializations of and hashtags for governmental (#GovEpi) and field epidemiologists (#FETP #FieldEpi), respectively; see Box 1. Twitter facilitates fluid collaborations with related disciplines such as data scientists (#DataScience) that have become increasingly important to epidemic and pandemic response in recent years. Science communication is tagged under #SciComm; the specific topic of social media for epidemiologists is tagged under #SoMe4epis. In addition, peer-support, expression of difficulties, venting and a safe place to share “failures” such as unsuccessful experiments and rejected manuscripts or grant applications, are advantages of the online community. The social support structure might be the one that is psychologically most valuable, generating the feeling to belong to a global community.

The down side

The presence and engagement of more field epidemiologists on online platforms can counter misinformation and provide reliable information in a sphere that is characterised by a general lack of curation. However, there is a risk of getting stuck in so-called filter bubbles where only views in line with one’s own are reinforced. This is enhanced further

by Twitter's inherent functions being geared towards accumulating likes and followers. Hence, accurately sharing information might not always be the (only) aim of interaction on such a platform.

Furthermore, the risk of misunderstandings can be high, especially in the shortened and low-threshold communication that Twitter demands. This coupled with the non-private nature of the platform means that what is normal disagreement which generally helps the scientific process, can become something perceived as an argument between scientists by non-scientists and can thus undermine public trust in science. Additionally, it is not always obvious who "the experts" are. With a topic that is extremely polarizing and public like the pandemic, there is an inherent risk of the (interlinked) phenomena of epistemic trespassing (Adam 2020), bandwagoning (Darwin 2020) and related to the latter what has been aptly called 'covidization' (Adam 2020, Bramstedt 2020). Twitter in such cases provides an additional platform for this.

The infodemic

The COVID-19 pandemic is accompanied by an infodemic; an abundance of information - some accurate and some not – which makes it harder for people to find trustworthy information. Discussions about fake news have led to a new focus on critical thinking, fact checking and media literacy, as a critical skill to discover the verifiability of a given news-piece in front of you ("How To Spot Fake News", in Figure 3) (Kiely and Robertson 2016). Social listening is essential to understand where infodemics originate and how and why they spread. Tracing information narratives, as well as "information voids", can

help effective communication. Digital tools such as the recently launched EARS Platform (Early AI-supported Response with Social Listening), and an international study on digital crisis interaction among Gen Z and Millennials (WHO, Wunderman Thompson et al. 2021), can help guide decision makers in developing communication strategies (WHO , WHO 2021). This is particularly important as the polarization taking place in our societies intensifies in online niche cultures.

Social media training

The unique advantages and functionalities, as well as the inherent negative effects of social media and platforms are not always well known or understood by epidemiologists and public health microbiologists. These should be addressed in a balanced manner, underlining the need for social media training as an integral part of communication and media training of FETPs. A recent survey (Parry, Kirk et al. 2021) among the applied epidemiology workforce identified gaps in social and communication skills; only 11% of respondents received training in this area. More training for field epidemiologists is underway. With the workshop “Social Media for Public Health Professional” organised in 2019 by the EPIET Alumni Network (@EAN_Board), training material on social media has been developed, including a case study on the challenges of using social media during an international epidemic (Medialdea Carrera 2019). Furthermore, in the context of the COVID-19 pandemic, the WHO created online infodemic management course (OpenWHO 2020), as well as a 4-week online training (WHO 2021).

The (online) field

What would John Snow have tweeted, back in 1854? Or Florence Nightingale, along with her Rose Chart in 1858? The way that field epidemiologists communicate and maintain their network has changed drastically in the 25-year history of EPIET, let alone in the nearly 70 years since the first class of CDC EIS officers started their work. The first cohort of EPIET having vivid memories of the then novel use of email. Today, it is hard to imagine FETP fellows not using social media both personally and professionally. Never before was there a bigger need than now for a virtual and online community among all field epidemiologists but especially among the current FETP fellows, who normally benefit from learning together as well as from one another in person. Great resources on how to get started on Twitter are freely available online (Bik and Goldstein 2013, Cheplygina, Hermans et al. 2020, Quintana 2020, Boender 2021) and we have provided a list of key hashtags and accounts to follow (Boxes 1-2).

In 2020 and 2021, many traditional networking events such as conferences the FETP International Nights as well as training modules are suspended or moved online, which takes away a big part of in-person networking and spontaneous exchange. In fact, engaging on Twitter can be used to make such online events more interactive, and increases its reach beyond the crowd that could have travelled. Additionally, Twitter enables collaboration and network building across programmes, either through official networks such as the Training Programs in Epidemiology and Public Health Interventions Network (@TEPHINET) and their engagement on social media or in a more informal way. On the first #WorldFieldEpidemiologyDay, 7th September 2021, we

have the tools to come together, and communicate about and advocate for field epidemiology – online!

Additional information

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COI statement

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Author contributions

DRhT initiated the manuscript, and provided supervision. CCH and TSB wrote the manuscript, with input from DRT.

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Boxes & figures

Box 1: Suggestions for #hashtags to use and follow

Communication	Epidemiology	Research	More specific, examples
#SciComm #ScientistsWhoSelfie #ActuallivingScientist #DayInTheSciLife #UniqueScientists #STEM #STEMdiversity #WomenInSTEM #SciArt #infodemiology	#EpiTwitter #EpiBookClub #PublicHealth #GlobalHealth #FETP #EPIET #EUPHEM #FieldEpi #Rstats #TidyTuesday #DataScience #StatsTwitter #GovEpi #SoMe4epis	#AcademicTwitter #AcademicChatter #ECchat #PhDLife #PhDchat Conference-specific, e.g. #ESCAIDE #COVIDUnknowns #IKEEP	#WorldFieldEpidemiologyDay #Outbreak #COVID—19 #HIV #AMR #pediatrics #StayHome

Box 2: Suggestions for @Accounts to follow

Institutes	Groups/Projects/Platforms	People
@WHO @WHOGOARN @WO_AFRO @WHO_Europe @ECDC_EU @PHE_uk @rivm @rki_de @MSF @CDC @NIH @EMA_News @US_FDA	@TEPHINET @EANboard @ISID_ORG @ESCAIDE @medrxivpreprint @biorxivpreprint @IJID @EID @Eurosurveillance @PLOSmedicine @ProMED_mail @BMC_series @RladiesGlobal @RealScientists	@DrTedros @mvankerkhove @DrMikeRyan ... FETP fellows and graduates on twitter: https://twitter.com/i/lists/1168077561404035072



Dr. Anne Marie Darling
@amdar1ing



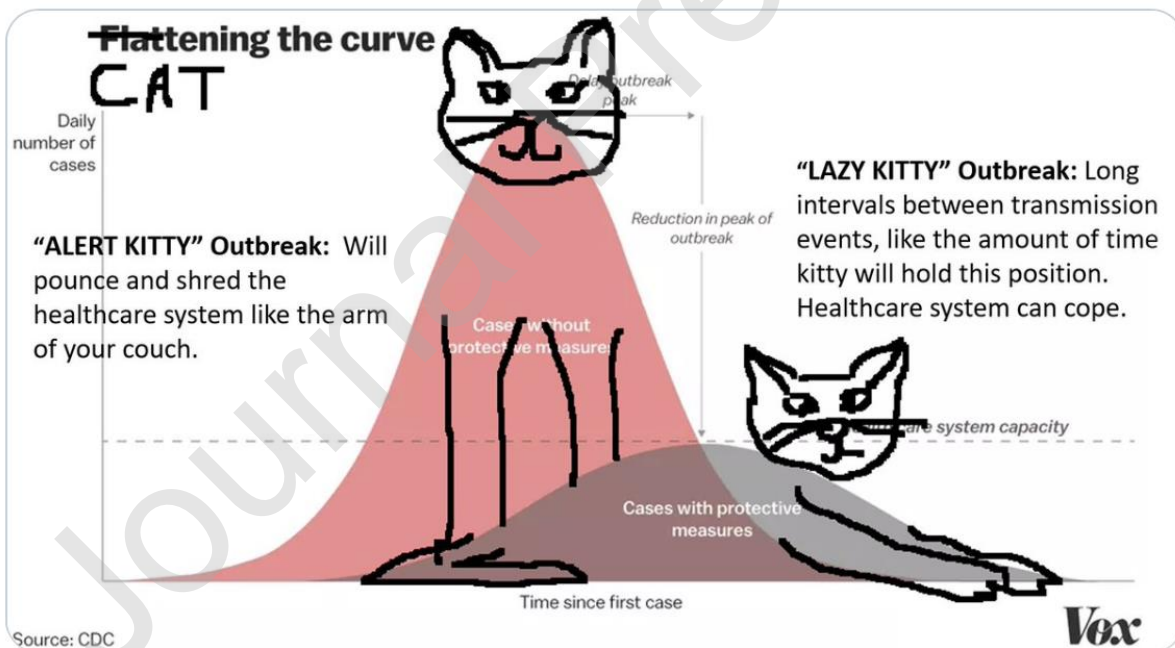
Lots of science-y folks are posting this graph. But if there is one thing I have learned from being on the internet, it is this:

Data/graphs: Not compelling to many.

Kitties: Compelling to many.

So I present: [#Catteningthecurve](#).

[#scicomm](#) [#epitwitter](#)



12:16 AM · Mar 12, 2020 · Twitter Web App

25K Retweets **2,997** Quote Tweets **54.9K** Likes

Figure 1. Tweet by Dr Anne Marie Darlin (@amdar1ing) (Darlin AM [@amdar1ing] 2020) on the #CatteningtTheCurve message for science communication(#SciComm) and the #EpiTwitter community . Screenshot made on 2 May 202

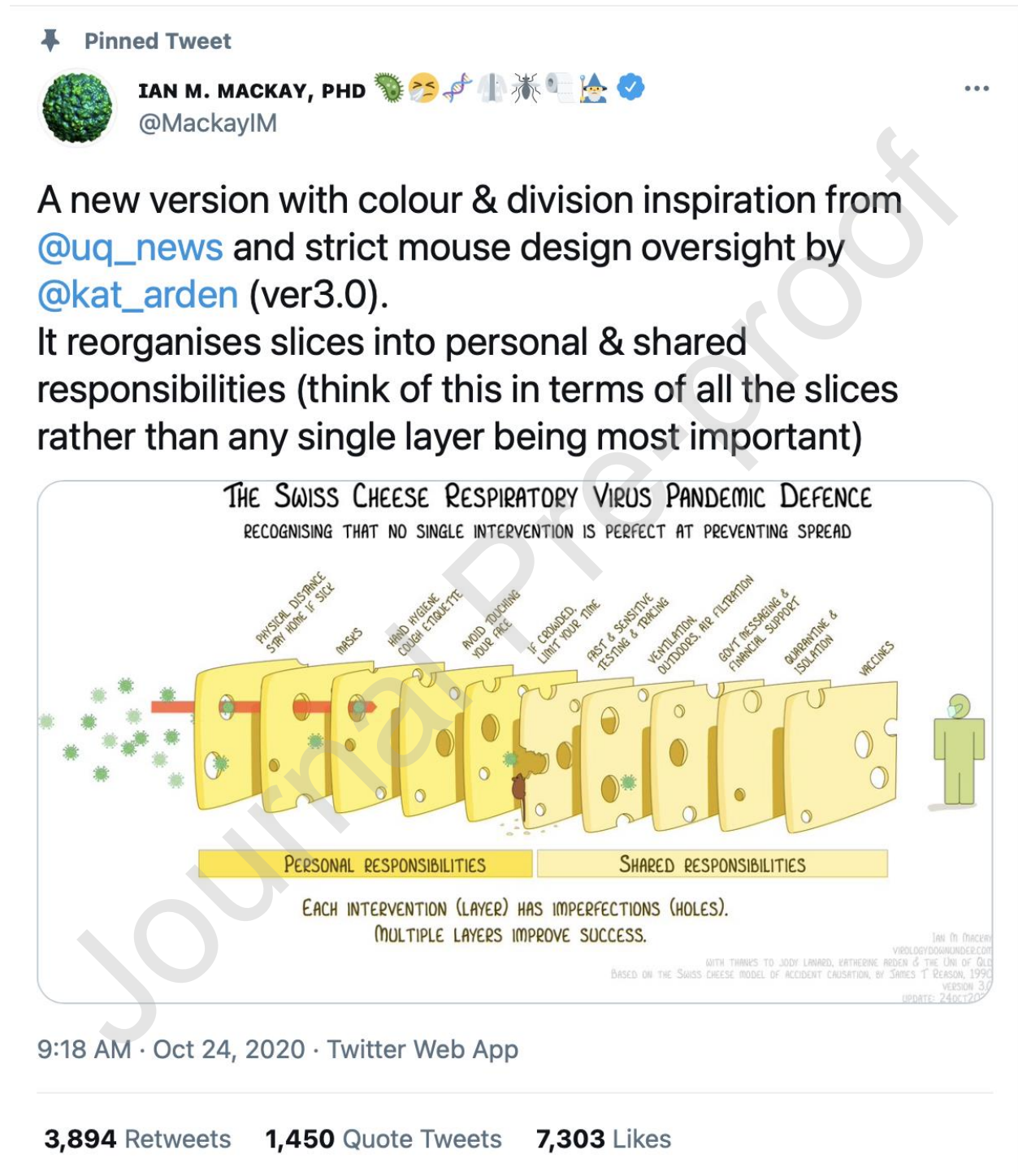


Figure 2

A) Tweet by Dr. Ian M. Macay (@MackayIM) (Mackay I [@MackayIM] 2020) on the Swiss Cheese respiratory Virus Pandemic Defense. The model is based on the cumulative effect act/accident causation model by James Reason (Reason, Broadbent et al. 1990). Screenshot made on 2 May 2021



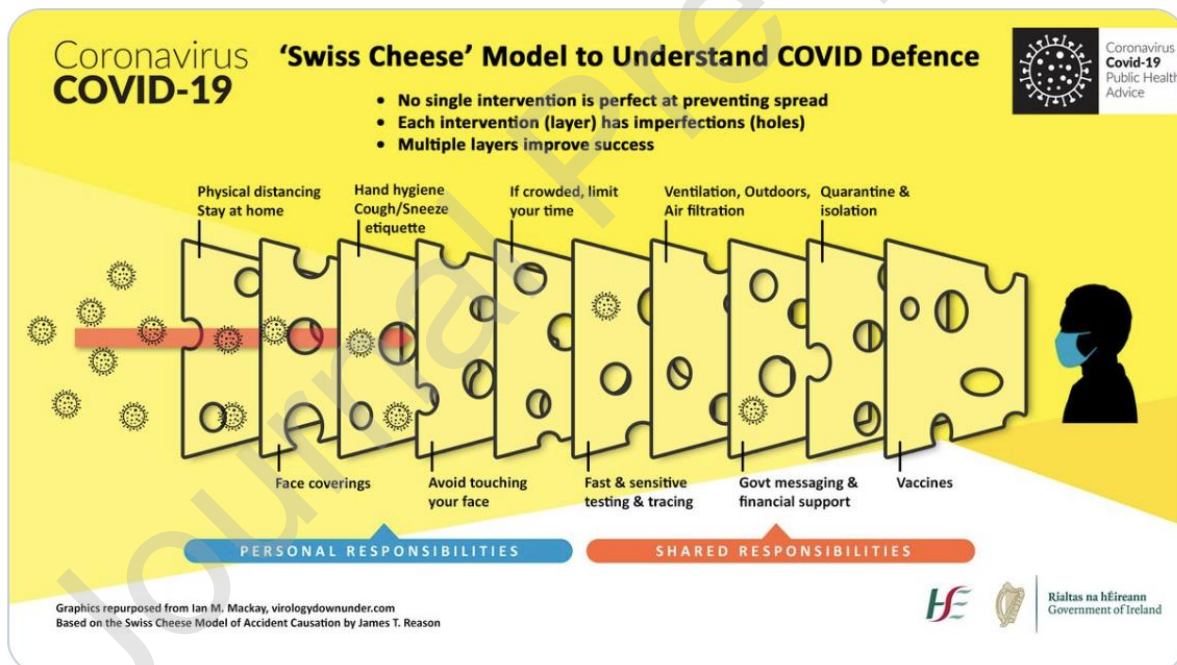
Dr Tony Holohan ✓
@CMOIreland

...

No single intervention is perfect at preventing the spread of **#COVID19**, it takes many different individual actions to slow down its spread. Every action you take is another layer of protection between you & the virus

- the more layers you have the more protection you have.

[Tweet vertalen](#)



Department of Health

6:42 p.m. · 5 feb. 2021 · Twitter Web App

391 Retweets **64** Geciteerde Tweets **1.604** Vind-ik-leuks

B) Tweet by Dr Tony Holohan (@CMOIreland) (Holohan T [@CMOIreland] 2021) spreading the #SwissCheeseModel message with official communication material by the Irish Department of Health (@roinnslaite)



Figure 3. Infographic to discover the verifiability of a given news-piece in front of you. CC-BY-4.0: The International Federation of Library Associations and Institutions (IFLA), based on FactCheck.org's 2016 article How to Spot Fake News (Kiely and Robertson 2016).

The infographic has been licensed under the CC-BY-4.0 license and is currently available in 46 languages, here: <https://www.ifla.org/publications/node/11174>.