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Clarify not simplify

Is COVID-19 more complex than the 35 year span of EastEnders?
Sawsan Khuri and Nasara Al-Hassan discuss.

If a person can keep up with all the convoluted, interconnected, shifting plot lines of EastEnders[1], then they should be able to understand science. It is therefore up to us scientists to change how we communicate science to the general public.

We have spent far too long trying to simplify science, with the arrogant, patronising illusion that we are more intelligent than the general public. We are not. We are trained to think deeply and methodically about a narrow focus topic and how it fits into a broader context, but this does not make us more intelligent than anyone else. We've basically been shouting down to the public about science instead of communicating its complexity with clarity and putting science (or any STEM[2] subject for that matter) in direct relevance to everyday life.

Take the current COVID-19 pandemic for example. It has undoubtedly accelerated our switch to a more digital normal, and it has also highlighted flaws in the health communication process. Populations of intelligent people worldwide continue to breach safety guidelines which are based on scientific evidence, and flout restrictions even though the risks of doing so had been communicated. How much of this was to do with how the pandemic narrative was being communicated? A quick informal survey highlighted that the most common complaint about the information people were getting was "it's so confusing".

The public quickly understood the simple message of wearing masks, washing hands and maintaining physical distances. However, there was a deep mistrust of information sources, particularly in the US and the UK, and the public remained confused about viral transmission, natural viral mutation frequencies, and exactly what vaccines are and how they work (Spring, 2020). In other words, they could follow clear guidelines, but were confused about the science behind them. We decided to first ask the question, how much complexity can the public handle, and then follow that up with exploring how we might better communicate scientific complexity.

How much complexity can the public handle?

We imagined that if an individual is able to understand the 35-year span of EastEnders with its multiple characters and storylines, then they should be able to understand the COVID-19 pandemic storyline and how to sensibly respond to it. EastEnders is the most consistently top ranking programme on the BBC, it is now in its 36th year, and includes a total of 2,225 characters, 154 families and over 6,200 episodes covering multiple convoluted and interconnected storylines (EastEnders Wiki, 2021). Our research identified the Mitchell family as being one of the iconic backbone families in EastEnders, and we constructed a complexity map
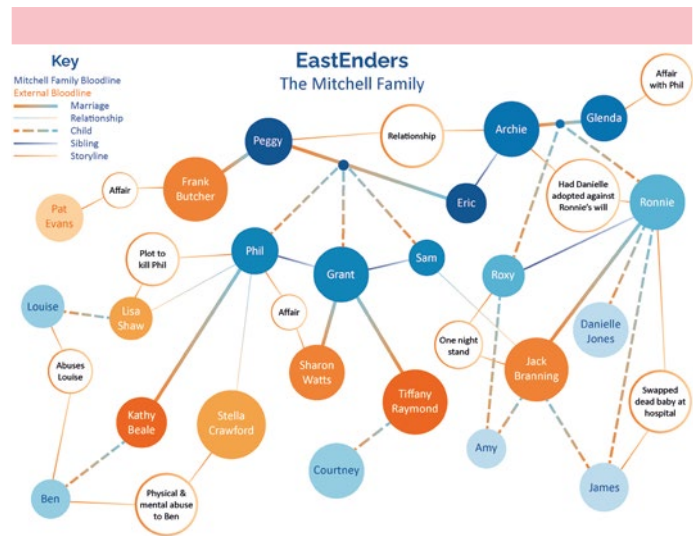
1. EastEnders is a long running UK soap opera.
2. STEM – Science, Technology, Engineering, and Mathematics.

Figure 1. Narrative diagram of one family from EastEnders. The emphasis here is on the complex storylines within this one family over the multidecade history of the soap opera.
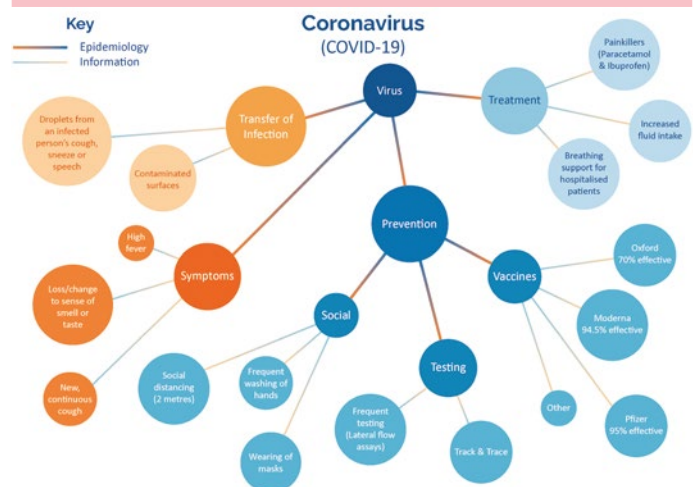

Figure 2. Narrative diagram of Coronavirus (COVID19), showing how it is transmitted and the symptoms it causes in humans (orange), and how people can prevent it and get treated in case of infection (blue).

highlighting some of the narrative storylines that this family was involved in over the years (Figure 1). Mapping how the extended family members were connected, we found multiple marriages, affairs, incidents of mental and physical abuse, and criminal behaviours. We thought the diagram was complex enough without layering it with plot lines about employment, racism and further interactions with other EastEnders families.

In contrast, the complexity diagram that maps out COVID-19 spread of infection, symptoms, prevention and treatment seemed rather straightforward (Figure 2). We kept it to the same shapes, lines and colours as the EastEnders diagram in order to avoid over-simplification of the

> *Communicate the complexity of science with clarity and put science in direct relevance to everyday life.*

message, and still ended up with a logical, clear diagram. We concluded that the public can handle quite a lot of complexity, and it wasn't the complexity of the COVID-19 storyline that was confusing the public.

What about risk perception and trust?
It wasn't really risk perception either (Sell, 2017). With hospital admission and death numbers reiterated in every news outlet and on social media, it seems that most people did understand the danger of contracting COVID-19. Early on it seemed as if it would only hurt the old and clinically vulnerable, but quite soon we were hearing reports of healthy young people being severely affected, and it didn't take long for people's risk perception to change. However, the fact that "science" was perceived as saying one thing and then "changing its mind" has led to issues of trust.

Trust is multilayered, and dependent on emotion as well as logic. Research shows that successful health communication occurs when it triggers positive emotions, induces curiosity, and can be experienced as entertaining, informative, and interesting (Davies et al., 2019). Individuals take in facts and arguments, but in the end they take decisions based on emotions such as fear. In April 2020, there was a movement to use the phrase "physical distance" instead of the more emotive and isolating "social distance", but this was not taken up by the mass media and was not a successful campaign (ECDC, 2020).

In addition to this, we had a tsunami of misinformation hitting social media which did not help the trust issue. Most of this misinformation was outrageously false and ultimately proved to be very dangerous, including claims that vaccinations will turn us into 5G radars, and that ingesting cleaning detergents or alcohol would kill the virus before it kills us. How did we get to this, how might we get out of it?

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Clarify the complexity instead of trying to simplify a complex system
Science is a journey of discovery, and along this journey we find some things hold true over the decades (gravity, evolution), some are utterly refuted (flat earth, static universe) and most things, particularly in the life sciences, get refined as we learn more about them. Does the public know that even Einstein was wrong about some things (static universe) and that this is part and parcel of the scientific journey of discovery?

Technological advances have revolutionised science, it is high time we revolutionised science communication. A paradigm shift in science communication would be to start accepting that the public can handle complexity, and that we should be clarifying our messages instead of simplifying them.

To clarify a point is to empower the recipient.
People are not passive recipients of information, throwing information at them from a podium only stimulates submissive behaviour and is likely to backfire. There is no need to blind them with x and y axes and pie charts when an effective and beautiful infographic style data visualisation would do a better job at clarifying why we are asking them to change their ways. And we need to get in there quick and flood social media with a tsunami of this sort of clear and empowering information before we lose control of the process. Let's clarify the complexity and allow the public to own their learning of science. ■

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