

Blurring the lines

Journalism and epidemiology in the time of corona

Journalism has borrowed tools and expertise from epidemiology in reporting on Covid-19. Epidemiologists should borrow from journalists too, says **Sandra Alba**

If you were to compare the work of an epidemiologist to that of a journalist, the epidemiologist might bristle at the comparison. Throughout its more recent history, epidemiology has at times been criticised for being an inexact descriptive science, closer to a form of journalism,¹ and so it has strived to demarcate itself as a discipline in its own right.²

But during the Covid-19 pandemic, the comparison between journalism and epidemiology has taken on a new dimension. As the statistician Irineo Cabreros argued in an opinion piece for *Undark* (bit.ly/3kepslG), data journalists are blurring the lines between journalism and epidemiology – going from merely “reporting” to “doing” science.

In seeking to help their readers better understand the pandemic and its progression, these journalists have borrowed the tools and sought the expertise and advice of epidemiologists, biostatisticians, and others. Here, I speak to two of those journalists to learn more about their experience of reporting on the pandemic. I also identify journalistic tools and approaches that epidemiologists might apply to their own work.

Overnight epidemiologists

In February 2020, the first confirmed cases of Covid-19 emerged in Italy. In Milan, Luca Salvioli and his team at *Il Sole 24 Ore*, a national daily business newspaper, promptly started compiling a Covid-19 database. At first, data came from an independent foundation and news agency, then from official reports by the civil protection agency (Protezione Civile, the body leading the epidemic response in Italy). But the data flow from hospitals to regions and to the national level was slow, partly because the system was

not fully digitised. As the epidemic quickly gathered pace, the civil protection agency was overwhelmed and unable to keep up with the data reports. For a few weeks, *Il Sole* managed and compiled the only national digital database for the whole country: public data were available digitally only in the middle of March.

Meanwhile, in London, John Burn-Murdoch and his team at the *Financial Times* were tracking the number of confirmed cases – both in the UK and abroad. Like many news outlets across Europe, they were keeping a close eye on Italy, hoping for the best but fearing the worst for the evolution of the epidemic in their own country.

Only a few weeks after its first cases, Italy found itself in the midst of a national public health emergency. To the shock of many neighbouring countries (who still had no idea what was awaiting them), the nation was put under a strict lockdown on 9 March. During this time, the civil protection agency held daily press conferences to provide epidemiological updates to a nation watching in horror as the number of deaths doubled, day after day. Salvioli and his team soon realised that the agency’s dry official reports had a number of shortcomings. “One of the main problems was that they did not distinguish clearly between daily new (incident) cases and active (prevalent) cases, leaving the public confused as to how the situation was really evolving,” says Salvioli. “They also did not contextualise the number of positive cases found in relation to the number of tests performed – which was an issue in the beginning because Italy could not keep up with testing.” This marked a crucial turning point for Salvioli and his team, who started running a daily update in parallel

with the official one – with all caveats and interpretations – adding new data and charts on the Lab24 dashboard (bit.ly/3DFTvcn).

Early March also marked a turning point for Burn-Murdoch and colleagues in London, as it was starting to become clear that the UK would soon follow Italy into the Covid-19 maelstrom. Burn-Murdoch prepared a graph to understand whether the UK was on a similar path to Italy. He compiled data from several countries showing the cumulative number of cases, by number of days since the hundredth case. His coronavirus trajectory tracker was published in a *Financial Times* article on 11 March and posted on Twitter the same day (Figure 1; bit.ly/3dBC8Ps). According to Burn-Murdoch, “the story convincingly showed that

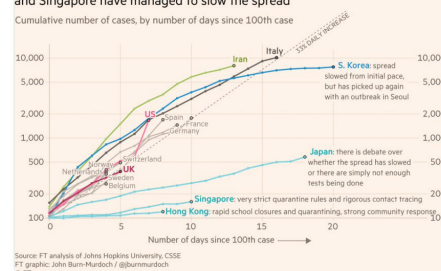


John Burn-Murdoch
@burnmurdoch

NEW on coronavirus: many western countries may soon face Italy's situation

Case numbers since outbreaks began in several countries have tracked a ~33% daily rise. This is as true for UK, France, Germany as Italy; the latter is simply further down the path ft.com/content/a26f6f...

Most western countries are on the same coronavirus trajectory. Hong Kong and Singapore have managed to slow the spread



1:49 PM · Mar 11, 2020 · Twitter Web App

4,586 Retweets 920 Quote Tweets 6,522 Likes

Figure 1: John Burn-Murdoch’s tweet, published 11 March 2020, about the *FT*’s coronavirus tracker.



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► the number of cases was doubling very quickly in the UK, and that the UK was not four but two weeks behind Italy". This provided hard evidence that a greater sense of urgency was needed in government, at a time when Prime Minister Boris Johnson and his advisors were still defending a herd immunity approach for the country. The public response to this was huge – Burn-Murdoch's Twitter post was retweeted over 5,000 times. On 26 March, the UK followed Italy in implementing its own national lockdown.

Points of reference

In the many months that have passed since those first lockdowns, and throughout the ups and downs of the pandemic, readers have turned to the *FT* and *Il Sole* for regular data updates. By June 2021, Salvioli told me, the Lab24 dashboard had racked up 175 million page views, from 55 million unique browsers – an astounding feat for a country of just over 60 million people. Checking in on Burn-Murdoch's Twitter updates also became a ritual for thousands of people across the UK and beyond who were anxiously monitoring the evolution of the pandemic. Burn-Murdoch and his team went on to update their now iconic coronavirus trajectory tracker (on.ft.com/37qfAyO), adding more and more graphs and analyses. Although the *FT* has a solid and sizeable readership in normal times, the coronavirus tracker is credited with driving a substantial increase in the *FT*'s website traffic as well as a rise in its number of subscriptions (bit.ly/3ElysqZ).

What stands out most about the coverage produced by Salvioli, Burn-Murdoch and colleagues is the participatory nature of their analytical approach – reflecting the close relationship that journalists can have with their readers. Burn-Murdoch, for example, engaged very closely with readers on Twitter early on in the pandemic. In March 2020, as lockdowns began, Burn-Murdoch shared his now famous multi-country tracking graphs daily, debating and clarifying analytical strategies with readers: deaths versus cases, new versus cumulative cases, per 100,000 versus raw numbers, linear versus logarithmic scale. There were interesting discussions on his Twitter feed about the merits of the various choices. The *FT* interactive dashboard (bit.ly/3ybAsWx) now enables readers to choose their own options, and those Twitter

discussions helped to inform the dashboard's documentation. For example, on cases versus deaths, the supporting text explains: "Confirmed case counts depend heavily on the extent of countries' very different testing regimes, so higher totals may simply reflect more testing. Deaths are somewhat more reliable, but remain problematic because countries have different rules for what deaths to include in their official numbers." On logarithmic versus linear scales, it says: "Log scales are particularly suited to displaying trends in relative rates of change, like a virus spreading. By comparing the slopes of two lines, a log scale allows us to compare epidemics at a very early stage with those that are much more advanced". And regarding population adjustments, it notes that: "Population matters least in the early stages of an epidemic because cases are likely to be highly concentrated in particular regions like Hubei or Lombardy. Later, though, viewing the values per 100,000 people gives a sense of the pandemic's relative strain on countries' resources."

For his team's ability to quickly develop the skills needed to analyse and contextualise Covid-19 data, Salvioli credits the quantitative training of *Il Sole*'s journalists as well as its engagement with experts. "We were all used to reporting and critically appraising data, by triangulating different data sources," he says. "But in addition, we also listened to experts. We got hundreds of emails from people suggesting different ways to analyse the data We filtered the information and engaged with those who were truly experts and took on their suggestions. It became a collaborative effort to make sense of a disease barely known to humankind."

Burn-Murdoch tells a similar story, although social media played a more important role for him. "For me it was quite an iterative strategy," he says. "First, I closely followed what the epidemiologists were doing and discussing online to guide my analyses – monitoring daily increases and decreases, flattening the curve, these were all concepts I learned from epidemiologists. I combined these with my approach and tools to analysing financial data. Working with logged data was quite a natural strategy for me as it is often done with financial data, and I quickly started using seven-day rolling averages to adjust for the impact of administrative delays

to reporting new data over weekends. Then I actively sought feedback, following up on any useful comments on social media. Sometimes specialists – biologists, virologists, epidemiologists – reached out to me directly with suggestions and I would discuss alternative strategies with them."

Lessons for epidemiologists

Salvioli and Burn-Murdoch have no formal training in epidemiology, yet they managed to pull off an epidemiological project that would make many epidemiologists proud. And just as they learned and benefited from the work being done by epidemiologists during the pandemic, I think epidemiologists can learn from them too. Here are five important lessons.

Try something new

Salvioli and Burn-Murdoch essentially applied their set of skills (analysis and reporting of financial data) to a new content area (the epidemiology of an emerging infectious disease) and actively sought feedback from experts to validate their approach. Herein lies an important lesson: many skills are transferable. Applying unused tools and approaches to a given content area may result in a product that is more than the sum of its parts. You may get things wrong the first few times, but with humility and openness to discussing and learning from content experts, your efforts may result in unexpected breakthroughs and novel insights.

Think visually

Data visualisations produced by *Il Sole* and the *Financial Times* offer great examples of how to make data accessible, appealing and relatable. Their dashboards provide dynamic graphs that can be updated at the click of a button. Examples include graphs that allow users to switch between log and natural scale to analyse trends in Covid-19 cases, or graphs that can display different variables or data for different geographical regions thanks to a filter.

Both outlets also produce animated graphs – either GIFs or videos that consecutively plot different data points along the same axes. These are especially suited to time series data and can help provide additional context or identify emerging patterns. One example is Burn-Murdoch's animated graph displaying historical data on intensive care

unit (ICU) admissions for flu (including winter 2017–18, a record high) compared to Covid-19 ICU admissions – convincingly making the case that Covid-19 is more than just a bad flu (bit.ly/3IBOZQ2). Salvioli also uses animated graphs in short explanatory videos (for example, on the effect of vaccines: bit.ly/3pD7B9C) exemplifying the power of animated graphs to tell a story.

Programming languages such as Java (used for both the *FT* and Lab24 dashboards) and R will make the most professional-looking dashboards and animated graphs. But simple, accessible tools such as Excel and Google Sheets can also create non-static visualisations. Learning how to master the skills needed to make such graphs is an investment that can pay off. Indeed, these types of visualisations can help end-users to quickly engage with data and focus on the issues which are most relevant to them.

Tell a story

A number in itself is not a story – and a story is easier to understand and remember than a number. Gifted storytellers may be more likely to become journalists than epidemiologists, but just as Salvioli and Burn-Murdoch were able to acquire epidemiological know-how, so epidemiologists can learn a few storytelling tricks to write in a more compelling way. *Making Data Meaningful*, published by the United Nations Economic Commission for Europe, provides useful hands-on guidance for statistical storytelling (bit.ly/31Pf5ye). First and foremost, it says: “You should think in terms of issues or themes, rather than a description of data. ... A statistical story shows readers the significance, importance and relevance of the most current information. In other words, it answers the question: *Why should my audience want to read about this?*”

Some formats may lend themselves better to this style than others. Scientific articles usually need to follow fairly rigid structures, so if you are an academic epidemiologist it is worth considering additional forms of writing to reach the widest possible audience. People who do not read your academic articles may read related digests, briefs, blogs, etc. These will have a lot more impact if they are written in a more journalistic style.

Also, as Helen Sword has shown by studying over a thousand peer-reviewed articles in a range of disciplines, journal

editors and readers welcome more concrete and personal writing styles. In her book *Stylish Academic Writing* she reveals a surprising gap between how academics describe good writing and the way they actually write.³ She also offers concrete and empowering advice to academics who want to shift from technical writing to a more vivid prose.

Engage your audience

Throughout the pandemic – but especially at the beginning as they were honing their analytical approach – Salvioli and Burn-Murdoch actively sought to connect with their readers. In journalism this is known as audience engagement. Engaged journalism is described as “an inclusive practice that prioritizes the information needs and wants of the community members it serves, creates collaborative space for the audience in all aspects of the journalistic process, and is dedicated to building and preserving trusting relationships between journalists and the public” (bit.ly/3lORo1h). Loss of trust is a common threat to both journalism and epidemiology,⁴ and this is perhaps where the two disciplines have the most to learn from each other.

For Burn-Murdoch, social media has proved to be a very effective platform for audience engagement. He posts his own articles on Covid-19 as well as other related scientific information from a variety of trusted sources on a daily basis, providing context and needed caveats, and he responds to comments and questions. In that sense his approach is very similar to the “superstar” scientists who have actively promoted rational evidence-based understanding of the pandemic on social media platforms – offering a much-needed pushback to the tide of anti-science and fake news. Examples of these superstars include the Italian virologist Roberto Burioni (bit.ly/3rSXNlf), the Texas-based paediatrician Peter Hotez (bit.ly/3q2JoLN), and the epidemiologists Ellie Murray (bit.ly/31Ph6KO) and Gideon Meyerowitz-Katz (bit.ly/3lGuqBR), who count their followers in the tens and hundreds of thousands.

According to a recent *Nature* article, engaging with the public by sharing work and expertise through social media is an essential part of being a scientist nowadays, to nurture trust in science. It can help prevent the spread of fake

stories, and also have career benefits by raising your profile as a scientist – although it should not turn into an all-absorbing activity, taking time and focus away from your “main” job.⁵

Be timely

As with many news outlets, *Il Sole* and the *Financial Times* have provided daily updates on the Covid-19 pandemic. This pace was dictated by the speed of the pandemic’s spread and, as journalists, Salvioli and Burn-Murdoch were able to keep up with it. For epidemiologists, many of whom are trained and currently work in academic or semi-academic settings, this timeliness can be very difficult to achieve, but timeliness is an important attribute of data quality. Indeed, it is one of the OECD dimensions of statistical data quality – including relevance, credibility, accessibility, interpretability, coherence, and cost-efficiency. There can be both a trade-off and an interdependence between these different dimensions. Ultimately, if your analyses are produced and shared with too long a delay, they can lose their relevance, and therefore may no longer be of use.

Conclusion

The Covid-19 pandemic may go down in history as the defining event of our lifetimes. For epidemiologists, it should mark the moment when being compared to a journalist was no longer considered an affront to their scientific standing. Epidemiologists and journalists – working separately and together – have provided timely, balanced and relevant analyses to decision-makers and the public during this ongoing global health crisis. They have much in common – and much to learn from each other. ■

Disclosure statement

The author declares no competing interests.

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