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Revenge of the experts: Will COVID-19 renew or diminish public trust in science? ☆

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ABSTRACT

It is sometimes said that an effect of the COVID-19 pandemic will be heightened appreciation of the importance of scientific research and expertise. We test this hypothesis by examining how exposure to previous epidemics affected trust in science and scientists. Building on the "impressionable years hypothesis" that attitudes are durably formed during the ages 18–25, we focus on individuals exposed to epidemics in their country of residence at this particular stage of the life course. Combining data from a 2018 Wellcome Trust survey of more than 75,000 individuals in 138 countries with data on global epidemics since 1970, we show that such exposure has no impact on views of science as an endeavor but that it significantly reduces trust in scientists and in the benefits of their work. We also illustrate that the decline in trust is driven by the individuals with little previous training in science subjects. Finally, our evidence suggests that epidemic-induced distrust translates into lower compliance with health-related policies in the form of negative views towards vaccines and lower rates of child vaccination.

"More shutdowns are avoidable, but the public needs to trust science."
(Anthony Stephen Fauci, Director of the U.S. National Institute of Allergy and Infectious Diseases' remarks at a virtual symposium hosted by Harvard University on 5 August 2020)

1. Introduction

The Covid-19 pandemic has highlighted disagreements among scientists, leading to criticism from politicians and the public.[1] It has renewed long-standing concerns that lay perceptions of scientific disputes diminish the regard in which scientific findings are held and further "misunderstanding of how science operates and/or…[lead] people to ignore scientific advice" (Dieckmann and Johnson, 2019). It has put on display leaders' "longstanding practice of undermining scientific expertise for political purposes" (Friedman and Plumer, 2020) and of engaging in "denigration of scientific expertise and harassment of scientists" (Scientists for Science-Based Policy, 2020).

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[1] See, for example, the Conversation article from April 8, 2020: https://theconversation.com/coronavirus-why-experts-disagree-so-strongly-over-how-to-tackle-the-disease-135825.

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One can distinguish several questions under this heading. First, are assessments of science as an endeavor and scientists as experts affected positively or negatively by the circumstances of a pandemic? Second, will changes in attitudes and opinions adhere mainly to the scientific endeavor or individual scientists? Will any reassessment of the importance of science apply to both the undertaking and those engaging in it, or will the public continue to trust science as a potential source of a vaccine, for example, while criticizing individual scientists who warn that the time needed to develop that vaccine will be lengthy?

We investigate in this paper how exposure to past epidemics affected trust in science and scientists. We use data from the 2018 Wellcome Global Monitor (WGM), which includes responses to questions about trust in science and scientists from over 75,000 individuals in 138 countries. We link these individual responses to the incidence of epidemics since 1970 as tabulated in the EM-DAT International Disasters Database. Building on work suggesting that individual attitudes and behavior are durably molded in what psychologists refer to as the "impressionable" late-adolescent and early-adult years, we show that impressionable-year epidemic exposure does not influence respondents' long-term views of the value of science as an endeavor or of its role in containing the spread of diseases. However, such exposure is negatively associated with trust in scientists and, specifically, with views of their integrity and trustworthiness. Specifically, an individual with the highest exposure to an epidemic (relative to zero exposure) is 11 percentage points less likely to have trust in the scientist (the respective average of this variable in our sample is 76%).

Our data and setting allow us to extend and complement existing studies. We can examine trust in science and trust in scientists as separate outcomes. Using the cross-cohort variation generated by past epidemics, our analysis offers the broadest cross-national evidence to date on the relationship between exposure to epidemics and scientific trust. Whereas previous papers have looked at individual countries, our data cover 138 countries. This inspires greater confidence in the generality of the findings.

The negative relationship between past epidemic exposure during one's impressionable years and current trust in scientists is robust to controlling for a battery of political and economic shocks that may have coincided with an individual's impressionable years. We utilize the methodology developed by Oster (2019) to show that our results are unlikely to be driven by omitted variables. In addition, there is no such association in the case of trust in public health professionals (doctors, nurses, traditional healers, and others helping to manage the public-health consequences of an epidemic). And in line with the impressionable year hypothesis, this relationship is specific to the epidemic exposure between the ages of 18 and 25.

Public distrust in science and scientists during and following an epidemic can be a product both of individuals' backgrounds and of miscommunication by the scientific community. Such miscommunication, including conflicting statements by different experts, is more likely in crisis periods when the pressure to quickly produce and disseminate scientific findings is intense (IFPRI, 2020). Members of the public who are not familiar with the scientific process may interpret the conflicting views of scientists and criticism of some studies by the authors of others as signs of bias or dishonesty. This paper cannot analyze the first argument, due to lack of data on scientific communication during past epidemics. But we provide suggestive evidence for the second, showing that individuals with little scientific training drive the negative relationship between past epidemic exposure and trust in scientists.

Effective epidemic control depends on public compliance with government mandates based on scientific advice. For example, trust in scientists recommending policies such as mask wearing, social distancing, lockdowns and mass vaccination will be associated with greater compliance with those recommendations. We directly investigate this channel, establishing that epidemic-induced distrust in scientists is associated with lower compliance with health-related advice. In particular, we show that past epidemic exposure negatively shapes respondents' long-term attitudes towards vaccination and reduces the likelihood that their children are vaccinated against childhood diseases.

Our paper contributes to several strands of literature. First, there are a number of studies of the impact of epidemics on trust-related outcomes, which reach conflicting results. Aassve et al. (2020) find that the Spanish Flu had permanent negative consequences for individuals' social trust. Bol et al. (2020), on the other hand, survey citizens of 15 European countries and find that COVID-19-related lockdowns were associated with a 2% increase in trust in government in the short term. Fluckiger et al. (2019), focusing on Ebola in West Africa, provide evidence that exposure to the epidemic enhanced trust in government, especially where governments responded robustly. In contrast, Aksoy et al. (2020) find a negative impact of past exposure to epidemics on confidence in government.

In addition, we know of one paper that has explored changes in trust in science following the outbreak of COVID-19. Agley (2020) shows that the overall level of trust in science remained unchanged between December 2019 and March 2020 in the United States, although conservatives reported slight increases and liberals reported slight decreases.[2]

Second, our paper is related to the literature on the trust in science and expert advice. Gauchat (2012) investigates public trust in science in the United States and documents differences by social class, ethnicity, gender, church attendance, and region. Sapienza and Zingales (2013) examine whether information about the consensus views of economists affects the views of average citizens, finding that knowledge of expert views sometimes moves public opinion in the opposite direction.

Third, there is the literature on scientific communication, which shows that different findings across studies may be seen by the public as discrediting the investigators, depending on how disagreements are presented (Scheufele, 2013; Van der Bles et al., 2020). These analyses point to the importance of scientists cultivating an aura of trustworthiness, in addition to asserting expertise (Fiske and Dupree, 2014). Related to this is the literature concerned with science and public opinion (Drummond and Fischhoff, 2017), in which it is argued that scientific knowledge may be invoked or dismissed insofar as it supports or challenges non-scientific (economic or political) concerns.

Fourth, there is the literature on the impressionable years. A seminal study pointing to the importance of this stage of the lifecycle is the survey of women attending Bennington College between 1935 and 1939 (Newcomb, 1943; Newcomb et al., 1967), among whom beliefs and values formed then remained stable for long periods. An early statement of the resulting hypothesis is Dawson and Prewitt (1969), Krosnick and Alwin (1989), among others, then pinpoint the impressionable years as running from ages 18 to 25.

When rationalizing the importance of the impressionable years, some scholars draw on Mannheim's concept of the "fresh encounter," suggesting that views are durably formed when late adolescents first encounter new ideas or events. Others invoke Erikson (1968) to suggest that individuals at this age are open to new

[2] However, this study considers only the short-term impact of a single epidemic. In contrast, we consider a larger class of epidemics and test for persistent effects of experiencing epidemics during a critical juncture in individuals' life cycle, namely 'impressionable years'.

influences because they are at the stage of life when they are forming a sense of self and identity. Still others suggest that attitudes are pliable at this stage of the lifecycle because views have not yet been hardened by confirmatory information (Converse, 1976). Spear (2000) links the the impressionable years to work in neurology, suggesting that these neurochemical and anatomical changes between the adolescent and adult brain are associated with durable attitude formation. Niemi and Sobieszek (1977, p.221 et seq) suggest that only in the late adolescent years have young people developed "the cognitive capacity to deal with political ideas" and that the same can be said to some extent of individuals in their university years (p.222).

In terms of applications, Giuliano and Spilimbergo (2013) establish that experiencing a recession between the ages of 18 and 25 has a significant impact on political preferences and beliefs about the economy. Using survey data from Chile, Etchegaray et al. (2018) show that individuals in their impressionable years in periods of political repression have a greater tendency to withhold their opinions, compared to those who grew up in less repressive times. Farzanegan and Gholipour (2019) find that Iranians experiencing the Iran-Iraq War in their impressionable years are more likely to prioritize a strong defense.

Finally, the present paper is related to Aksoy et al. (2020), where we find a negative impact of past epidemic exposure in confidence in the current political leader and in the integrity of the elections through which that leader is selected. But whereas, in that paper, we were able to investigate trust in the leader only in one setting (that of national government), here we observe views of the trustworthiness of scientists in two different settings: universities and private companies. In addition, we are able to link the changes in trust in the responsible authorities with compliance with their advice; we show that epidemic exposure that erodes trust in scientists is also associated with a reduced willingness to vaccinate one's children, *both within the same group of individuals included in WGM survey*.

The remainder of the paper is organized as follows. Section 2 describes our data. Section Section 3 outlines our empirical design and identification strategy. Section 4 presents the baseline results, after which Section 5 concludes.

2. Data

Our principal data sources are 2018 Wellcome Global Monitor (WGM) and the EM-DAT International Disasters Database. WGM is a nationally representative survey fielded in 2018. Our final merged sample includes 138 countries. WGM is the first global survey of how people think and feel about key health and science challenges, including attitudes towards vaccines; trust in doctors, nurses and scientists; trust in medical advice from the government; whether people believe in the benefits of science.

The main outcome variables of interest come from questions asked of all WGM respondents regarding their trust in science and scientists:

(i) "in general, would you say that you trust science a lot, some, not much, or not at all?";
(ii) "how much do you trust scientists working in colleges/universities in this country to do each of the following?"
  a. to do their work with the intention of benefiting the public
  b. to be open and honest about who is paying for their work
(iii) "thinking about companies - for example, those who make medicines or agricultural supplies - how much do you trust scientists working for companies in this country to do each of the following?"
  c. to do their work with the intention of benefiting the public
  d. to be open and honest about who is paying for their work
(iv) "in general, how much do you trust scientists to find out accurate information about the world? A lot, some, not much, or not at all?"

Responses were coded on a 4-point Likert scale, ranging from "A lot" (1) to "Not at all" (4). We code "A lot" and "Some" as 1 and zero otherwise in order to estimate a Linear Probability Model (LPM).[3]

WGM also provides information on respondents' demographic characteristics (age, gender, educational attainment, marital status, religion, and urban/rural residence), labor market outcomes, and within-country income quintiles. Controlling for employment status and income allows us to measure the impact of past epidemics on trust in science and scientists beyond any direct effect of epidemics on material well-being.

We also examine responses to three parallel questions as placebo outcomes, namely whether the respondents have trust in doctors and nurses; hospitals and health clinics; traditional healers. This helps us to determine whether what we are capturing is the impact of epidemic exposure on views of scientists specifically, as distinct from any impact on views of healthcare-related institutions and professionals.

Data on the worldwide epidemic occurrence and effects are drawn from the EM-DAT International Disasters Database from 1970 to the present.[4] These data are compiled from UN agencies, non-governmental organizations, insurance companies, research institutes, press agencies, and other sources. It includes all epidemics (viral, bacterial, parasitic, fungal, and prion) meeting one or more of the following criteria: (i) 10 or more people dead; (ii) 100 or more people affected; (iii) declaration of a state of emergency; (iv) a call for international assistance.

Our dataset includes 47 different types of epidemics and pandemics since 1970. This includes large outbreaks of Cholera, Ebola, and H1N1 and also more limited epidemics. Averaged across available years, H1N1, Ebola, Dysentery, Measles, Meningitis, Cholera, Yellow Fever, Diarrhoeal Syndromes, Marburg Virus, and Pneumonia were the top 10 diseases causing epidemic mortality worldwide.

Many of these epidemics and pandemics affected multiple countries. 138 countries experienced at least one epidemic since 1970. This includes 51 countries in Africa, 40 in Asia, 22 in the Americas, 19 in Europe, and 5 in Oceania. The most epidemic-prone countries in the dataset are Niger (25), Nigeria (25), Congo (22), Cameroon (21), Mozambique (20), Sudan (20), Uganda (20) and India (19). Advanced countries in our sample all experienced 5 or fewer epidemics.[5]

Each epidemic is identified with the country where it took place. When an epidemic affects several countries, several separate entries are made to the database for each. EM-DAT provides information on the start and end date of the epidemic, the number of deaths, and the number of individuals affected. The number of individuals affected refers to the total number requiring immediate assistance (assistance with basic survival needs such as food, water, shelter, sanitation, and immediate medical treatment) during the period of emergency. We aggregate the epidemic related

[3] In Appendix Tables A16 and A17, we also show that our results are robust to using ordered logit and multinomial logit models.

[4] EM-DAT was established in 1973 as a non-profit within the School of Public Health of the Catholic University of Louvain; it subsequently became a collaborating center of the World Health Organization. It also gathers historical information on epidemics that took place before it was founded; however, those data are patchy and biased towards well-recorded epidemics. Hence we only focus on epidemic cases that EM-DAT "live" collected after it was founded in early 1970s.

[5] We provide the full country-year-epidemic list in Appendix Table A18.

information in this database at the county-year level and merge it with WGM. Fig. 1 provides a visual summary.

We also use country level information from the Cross-National Time-Series (CNTS) dataset to control for individuals' past experiences and get information on past media consumption (TV units per capita and radio units per capita). Country level past economic experience variables come from the World Bank. The data on political regime comes from the Polity.[6]

3. Empirical Model

To assess the effect of past exposure to an epidemic on an individual's trust in science and scientists, we estimate the following OLS specification:

$$Y_{i,c,a} = \beta_0 + \beta_1 X_i + \beta_2 \text{Exposure to epidemic}(18-25)_{ica} + \beta_3 C_c + \beta_4 A_a + \beta_5 C_c * \text{Age} + \varepsilon_{ica} \quad (1)$$

where Y_{ica} is a dummy variable indicating whether or not the respondent *i* with age *a* in country *c* has trust in science or scientists. To operationalize *Exposure to epidemic (18–25)*, we calculate for each individual the number of people affected by an epidemic as a share of the population, averaged over the 8 years when the individual was in his or her impressionable years (18–25 years old).[7] The coefficient of interest is β_2, which captures the impact of past exposure to an epidemic on the trust in science or scientists.

We specify the X_i vector of individual characteristics to include: indicator variables for living in an urban area and for having a child (any child under 15), and dummy variables for gender (male), employment status (full-time employed by an employer, full-time self-employed, part-time employed with intention for full-time, part-time employed with no intention for full-time, unemployed, out of workforce), religion (religious vs. non-religious), educational attainment (tertiary education, secondary education), and within-country income quintiles.

To account for unobservable characteristics, we include fixed effects separately at the levels of country (C_c) and age cohort (A_a) (that is, cohort fixed effects). The country dummies control for all variation in the outcome variable due to factors that vary cross-nationally. The cohort fixed effects control for the variation in the outcome variable caused by factors that are heterogeneous across (but homogenous within) birth cohorts.[8] By controlling for these and other variables separately, we can be confident that their effects are not being picked up by impressionable-year epidemic exposure. In addition to saturating our specification with country and cohort fixed-effects, we include country-specific age trends ($Cc*Age$).[9] These address the possibility that, even though we control for overall cohort and age-related factors, the interaction of age and attitudes may differ across countries. In further robustness checks, we also include country*income quintile, country*employment status and country*education fixed effects.

We cluster standard errors by country and use sampling weights provided by the WGM to make the data representative at the country level.

3.1. Identification

One can imagine several potential threats to this strategy. First, age-specific factors may matter if different generations were exposed to epidemics with different probabilities; given advances in science and improvements in national healthcare systems, one might anticipate that epidemics are less likely to be experienced by younger generations. We address these concerns by including a full set of cohort fixed effects determined by an individual's year of birth.

Second, generational trends in science attitudes could also be heterogeneous across countries. Some national cultures may be more flexible and open to change in individual values and beliefs, leading to larger differences across generations. We therefore include country-specific age trends in our models.

Third, although we fully saturate our specifications with fixed effects, there could still be other past exposures that are correlated with epidemics and matter for individuals' views regarding science and scientists. To capture these additional exposures, we control for various aspects of the political and socio-economic environment (GDP growth, GDP per capita, inflation rate, political regime -the Polity2 score-, assassinations, general strikes, terrorism/guerrilla warfare, purges, riots, revolutions, anti-government demonstrations, government crises, physicians per capita and university enrollment per capita) in the country in question during the individual's impressionable years. Thus, we confirm that including these controls for other past exposures and conditions has minimal impact on the stability of our coefficients of interest.

Lastly, we control for contemporaneous individual characteristics and economic circumstances as captured by the WGM. These contemporaneous controls minimize the possibility that the impact of a past epidemic is transferred to current outcomes via one of these variables. These variables might also be considered as 'bad controls' (Angrist and Pischke, 2009). As we reported in the Appendix A, removing them does not substantively change any of our findings.

4. Results

4.1. Main results

Table 1 reports the results for all dependent variables in WGM dataset related to respondents' views of scientists: whether the respondent has trust in scientists in their country; trusts that scientists working for private companies in their country aim to benefit the public; trusts that scientists working for private companies in their country are honest about who is paying for their work; trusts that scientists working for universities in their country aim to benefit the public; trusts that scientists working for universities in their country are honest about who is paying for their work; and trusts that scientists can find out accurate information about the world.

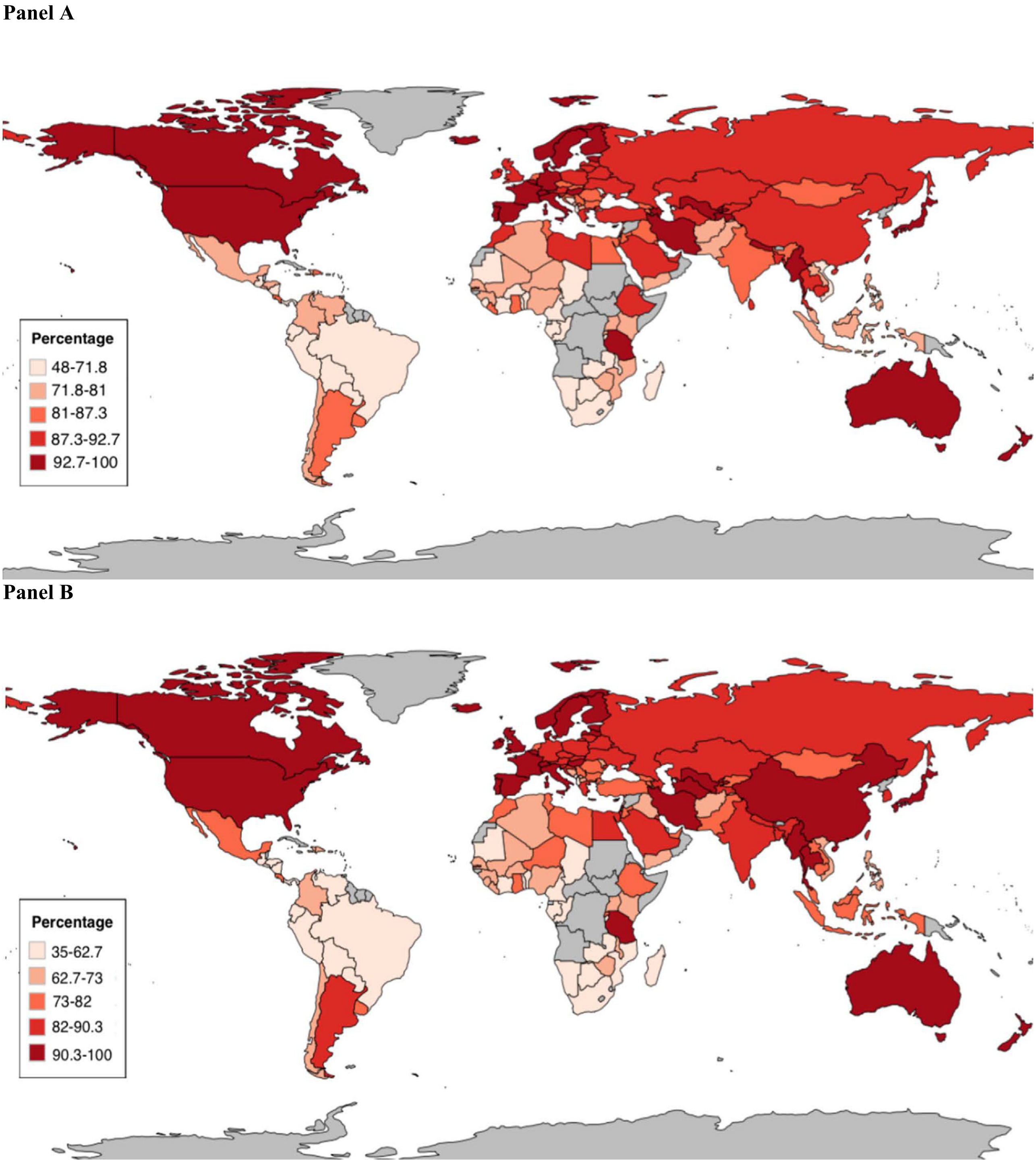
Models/Columns 1–3, estimated on the full sample of respondents, progressively increase the tightness of identification by adding controls at each step. Models/Columns 4–6 then add fixed effects, where individuals in the treatment and control groups are only compared within the same country and income level (Model 4), the same country and employment status (Model 5), and the same country and educational attainment (Model 6).

[6] Past experience variables include GDP growth, GDP per capita, the inflation rate, the political regime (the Polity2 score), assassinations, general strikes, terrorism/guerrilla warfare, purges, riots, revolutions, and anti-government demonstrations, government crises, physicians per capita and university enrollment per capita.

[7] In Appendix Tables A5 and A6, we show that our results are robust to using "population unadjusted epidemic exposure" variable. Additionally, the results are qualitatively same once we employ a time-invariant measure for population (see Appendix Tables A7 and A8).

[8] Since WGM contains a cross-section of countries at a single point in time (as of 2018), our cohort fixed effects fully coincide with the age dummies that one would ideally like to include in Eq. (1). Thus, even though we cannot separately estimate the age-fixed effects due to such perfect collinearity, our setting indirectly controls for all age-related heterogeneity by including these cohort fixed-effects.

[9] Our results remain virtually unchanged when we include country-quadratic age trends. These results are available upon request.



Notes: Panel A illustrates share of respondents who trust science a lot or some. Panel B illustrates share of respondents who trust scientists a lot or some. Countries are grouped in quintiles. Source: Wellcome Global Monitor, 2018.

Fig. 1. Share of respondents who trust science and scientists. Notes: Panel A illustrates share of respondents who trust science a lot or some. Panel B illustrates share of respondents who trust scientists a lot or some. Countries are grouped in quintiles. Source: Wellcome Global Monitor, 2018.

The coefficients on impressionable-year epidemic exposure are negative and significant at conventional levels in 29 of 36 cases.[10] The estimates in Column 3 of Table 1, for example, show that an individual with the highest exposure to epidemics (0.032, that is, the highest number of people affected by an epidemic as a share of the population averaged during an individual's formative years) relative to individuals with no exposure is on average 11 percentage points ($-3.454 * 0.032$) less likely to trust in scientists in their country (the respective average of this variable in our sample is 76%).[11]

[10] Later in a robustness check, we confirm the relevance of our treatment variable across multiple hypotheses.

[11] We use the highest number in terms of past epidemics exposure as this varible is highly skewed with more than half of the respondents having no experience at all; and thus, it would not be appropriate to benchmark the effect size with mean or median.

Table 1
The Impact of Exposure to Epidemic (18–25) on Trust in Scientists.

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome → Trust in scientists						
Exposure to Epidemic (18–25)	−2.937*	−2.821*	−3.454**	−3.408**	−3.162**	−3.525**
	(1.600)	(1.645)	(1.330)	(1.422)	(1.468)	(1.421)
Observations	83,014	82,854	82,854	82,854	82,854	82,854
Outcome → Scientists working for private companies benefit the public						
Exposure to Epidemic (18–25)	−1.552***	−1.559***	−1.283***	−1.289***	−1.141**	−1.346***
	(0.354)	(0.349)	(0.338)	(0.389)	(0.447)	(0.375)
Observations	81,554	81,406	81,406	81,406	81,406	81,406
Outcome → Scientists working for private companies are honest						
Exposure to Epidemic (18–25)	−2.105***	−2.106***	−1.731***	−1.915***	−1.611***	−1.779***
	(0.597)	(0.611)	(0.642)	(0.661)	(0.466)	(0.620)
Observations	76,856	76,723	76,723	76,723	76,723	76,723
Outcome → Scientists working for universities benefit the public						
Exposure to Epidemic (18–25)	0.150	0.226	−0.616	−0.836*	−0.572	−0.808*
	(0.727)	(0.752)	(0.478)	(0.459)	(0.500)	(0.448)
Observations	81,307	81,147	81,147	81,147	81,147	81,147
Outcome → Scientists working for universities are honest						
Exposure to Epidemic (18–25)	−3.042***	−2.980***	−3.330***	−3.442***	−3.259***	−3.337***
	(0.375)	(0.413)	(0.446)	(0.471)	(0.356)	(0.531)
Observations	76,123	75,992	75,992	75,992	75,992	75,992
Outcome → Scientists to find out accurate information						
Exposure to Epidemic (18–25)	−1.352	−1.188	−1.438**	−1.873***	−1.185	−1.704**
	(0.988)	(1.137)	(0.664)	(0.644)	(0.752)	(0.717)
Observations	84,104	83,939	83,939	83,939	83,939	83,939
Country fixed effects	Yes	Yes	Yes	No	No	No
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic characteristics	No	Yes	Yes	Yes	Yes	Yes
Income quintile fixed effects	No	Yes	Yes	No	Yes	Yes
Labour market controls	No	Yes	Yes	Yes	No	Yes
Country-specific age trends	No	No	Yes	Yes	Yes	Yes
Country * Income fixed effects	No	No	No	Yes	No	No
Country * Empl. fixed effects	No	No	No	No	Yes	No
Country * Educ. fixed effects	No	No	No	No	No	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. *Significant at 10%; **Significant at 5%; ***Significant at 1%.

Table 2 reports estimates of the same models for six additional dependent variables. The first three are related to the societal impact of science: whether the respondent has trust in science; thinks that science will help improve life for the next generation; and thinks that studying disease is a part of science. The next three are placebo tests that address the possibility that what we are picking up is not the impact on the perceived trustworthiness and public-spiritedness of scientists engaged in health-related research specifically but the impact on perceptions of individuals engaged in tasks related to healthcare and health outcomes generally. In contrast to Table 1, Table 2 shows that formative-year epidemic exposure has a positive, small and statistically insignificant effect on almost all of these outcome variables. The effect we find is not a general decline in trust in science, but only in scientists. It is not a general decline in trust in everyone engaged in health care, only in scientists researching health care related issues.[12]

4.2. Heterogeneity by the level of science education

Given that previous work points to science education as shaping views of science and scientists, we also estimate our main specification for two subsamples: respondents who learned about science at most at the primary school level, versus respondents who learned about science at least at the secondary school level. The results, in Table 3, reveal substantial differences. They suggest that our results are driven by the sample of individuals with little or no science education. Additional analysis (not presented here but available upon request) suggests that these results cannot be explained by the possible interruption in education due to exposure to an epidemic.[13]

[12] One could be concerned that our preferred specification (Model 3) in Tables 1 and 2 contains country-specific age trends, which could be collinear with our treatment variable (*Exposure to Epidemic (18–25)*). On the one hand, there is little to suspect that our treatment variable would vary in a certain direction in line with the age of the respondents in a country since we focus on the same past experience window (ages 18–25) *irrespective of what the age of the respondent is at the time of the survey*. On the other hand, it is reassuring that our results change very little when we drop these age trends in our estimations (see Models 1 and 2 in Tables 1 and 2).

[13] We also check the role of media consumption in shaping attitudes towards scientists at the time of the epidemics. To do so, we use the country-level data from CNTS, which reports TV units per capita and Radio units per capita for a large number of countries. In particular, we calculate the average values for each dimension during the impressionable years of each individual. We then create interaction terms, Exposure to Epidemic (18–25)*TV Per Capita (18–25) and Exposure to Epidemic (18–25)*Radio Per Capita (18–25), and include them (alongside standalone variables) in our baseline model as reported in Appendix Table A15. The results show that none of the interactions are statistically significant, suggesting that media consumption is not likely to be the main transmission channel in our setting.

Table 2
The Impact of Exposure to Epidemic (18–25) on Trust in Science and Placebo Outcomes.

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome → Have trust in science						
Exposure to Epidemic (18–25)	0.124	0.256	0.256	−0.039	0.533	0.164
	(0.503)	(0.599)	(0.408)	(0.484)	(0.406)	(0.423)
Observations	85,368	85,199	85,199	85,199	85,199	85,199
Outcome → Science and technology will help improve life						
Exposure to Epidemic (18–25)	0.562*	0.669*	0.685	0.641	0.730	0.655
	(0.336)	(0.357)	(0.462)	(0.482)	(0.489)	(0.457)
Observations	86,585	86,397	86,397	86,397	86,397	86,397
Outcome → Studying diseases is a part of science						
Exposure to Epidemic (18–25)	0.126	0.209	0.369	0.130	0.462	0.417
	(0.576)	(0.496)	(0.423)	(0.344)	(0.389)	(0.404)
Observations	88,326	88,138	88,138	88,138	88,138	88,138
Outcome → Have trust in doctors and nurses						
Exposure to Epidemic (18–25)	1.296	1.332	1.585	1.427	1.513	1.400
	(1.291)	(1.272)	(1.196)	(1.380)	(1.112)	(1.235)
Observations	92,026	91,835	91,835	91,835	91,835	91,835
Outcome → Have trust in hospitals and health clinics						
Exposure to Epidemic (18–25)	0.702	0.748	1.341	1.446	1.122	1.251
	(1.482)	(1.382)	(1.323)	(1.569)	(1.228)	(1.378)
Observations	90,030	89,851	89,851	89,851	89,851	89,851
Outcome → Have trust in traditional healers						
Exposure to Epidemic (18–25)	0.115	0.031	−0.696	−0.663	−0.987**	−0.667
	(1.056)	(0.966)	(0.505)	(0.480)	(0.405)	(0.501)
Observations	87,942	87,761	87,761	87,761	87,761	87,761
Country fixed effects	Yes	Yes	Yes	No	No	No
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic characteristics	No	Yes	Yes	Yes	Yes	Yes
Income quintile fixed effects	No	Yes	Yes	No	Yes	Yes
Labour market controls	No	Yes	Yes	Yes	No	Yes
Country-specific age trends	No	No	Yes	Yes	Yes	Yes
Country*Income fixed effects	No	No	No	Yes	No	No
Country*Empl. fixed effects	No	No	No	No	Yes	No
Country*Educ. fixed effects	No	No	No	No	No	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. *Significant at 10%; **Significant at 5%; ***Significant at 1%.

4.3. Are the results driven by other past experience?

In a robustness check, we control for other political and socio-economic experiences, the timing of which corresponds to the same impressionable years (ages 18–25). For each individual we add GDP growth, GDP per capita, inflation rate, political regime -Polity2 score-, assassinations, general strikes, terrorism/guerrilla warfare, purges, riots, revolutions, anti-government demonstrations, government crises, physicians per capita and university enrollment per capita at the time of the survey response.[14] If such shocks coincide with epidemics, omitting them may exaggerate the estimated effect of the latter.

Appendix Table A1 reports the results across the same six outcome variables related to trust in scientists and shows that the impact of epidemic exposure on trust in scientists -if anything- become larger, not smaller, once we control for these other past political and economic shocks. This is consistent with the idea that what we are capturing is specific to epidemics and not related to other coincident shocks.

4.4. Changes in actual behaviour

We ask whether the loss of trust in scientists has implications for actual behavior. We focus on changes in vaccine-related attitudes and on the tendency for individuals to vaccinate their own children. Table 4 presents estimates analogous to Model 3 of Table 1, while simultaneously controlling for other past economic and political shocks. Individuals exposed to epidemics in their impressionable years are more likely to have negative attitudes towards vaccination and less likely to vaccinate their children. This suggests that the change in attitudes that we document have consequences for actual behavior.

4.5. Robustness to omitted variable bias

One might be concerned that our results are driven by other omitted factors that shape the individuals' trust. We therefore follow the method proposed by Oster (2019) to investigate the importance of unobservables. In Appendix Table A2, we first reproduce the baseline estimates for our main outcomes in the top row. The second row then presents estimation bounds where we define R_{max} upper bound as 1.3 times the R-squared in specifications that control for observables.[15] The bottom row presents Oster's delta, which indicates the degree of selection on unobservables relative to observables that would be needed to fully explain our results by omitted variable bias.

The results show very limited movement in the coefficients. High delta values also indicate that the unobservables have less

[14] In particular, we calculate the average values for each one of these dimensions during the impressionable years of each individual. Including these past experiences as controls naturally makes for smaller samples, since the Cross-National Time-Series Data Archive covers only some of the countries and years in our main sample.

[15] Estimation bounds on the treatment effect range between the coefficient from the main specification and the coefficient estimated under the assumption that observables are as important as unobservables for the level of R_{max}. R_{max} specifies the maximum R-squared that can be achieved if all unobservables were included in the regression.

Table 3
The Impact of Exposure to Epidemic (18–25) on Confidence in Scientists by the Level of Science Education.

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
Sample → Respondents learned about science at *most* at primary school level						
Exposure to Epidemic (18–25)	−4.521***	−4.140***	−2.443**	0.186	−0.891	−0.253
	(0.888)	(1.162)	(0.971)	(1.323)	(3.436)	(0.488)
Observations	14,434	13,984	12,931	13,752	12,668	14,300
Sample → Respondents learned about science at *least* at secondary school level						
Exposure to Epidemic (18–25)	1.332	3.270***	−1.545	1.529	−0.441	−1.315
	(2.547)	(0.831)	(2.370)	(1.780)	(1.285)	(1.037)
Observations	57,892	57,054	54,130	57,206	53,755	59,232
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic		characteristics	Yes	Yes	Yes	Yes
Yes	Yes					
Income quintile fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Labour market controls	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific age trends	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. *Significant at 10%; **significant at 5%; ***significant at 1%.

Table 4
The Impact of Exposure to Epidemic on Attitudes towards Vaccines.

Outcome →	(1) Children received a vaccine	(2) Children received a vaccine	(3) Vaccines are important for children to have	(4) Vaccines are important for children to have	(5) Vaccines are safe	(6) Vaccines are safe	(7) Vaccines are effective	(8) Vaccines are effective
Exposure to Epidemic (18–25)	−1.341***	−1.479***	−1.562***	−1.272**	−4.694***	−4.461***	−2.446***	−1.959***
	(0.311)	(0.334)	(0.538)	(0.522)	(0.490)	(0.533)	(0.602)	(0.624)
Observations	25,774	25,774	30,955	30,955	30,330	30,330	30,383	30,383
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income quintile fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Labour market controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific age trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Past controls (18–25)	No	Yes	No	Yes	No	Yes	No	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

effect on our coefficient of interest than the observables. The value of Oster's delta ranges between 2 and 132 across models, which is reassuring, as it is unlikely that there are unobserved factors that are 2–132 times as important as all observables we include in our preferred specification.

4.6. Are the results unique to impressionable years?

The results in Appendix Table A3 suggest that the effect is insignificant when individuals are exposed to epidemics in any stage of life other than when they are between ages 18 and 25.

These results are consistent with the idea that there is something special about the late adolescent and early adult years that leaves a long-lasting legacy in beliefs and attitudes.

4.7. Multiple hypothesis testing

We also conducted multiple hypothesis testing by employing a randomization inference technique suggested by Young (2019). This helps us establish the robustness of our results for the null that our treatment does not have any effect across any of the outcome variables (i.e., treatment is irrelevant), taking into account the multiplicity of the hypothesis testing procedure. The method essentially builds on repeatedly randomizing the treatment variable in each estimation and comparing the pool of randomized estimates to the estimates derived via the true treatment variable. The results, presented in Appendix Table A4, show that our findings remain robust when evaluated via these joint tests of treatment significance.

4.8. Robustness to alternative treatment definitions

In our baseline results, we standardize our treatment variable by dividing the average number of epidemic-affected people with the average population size of the country during one's impressionable years. This standardization is crucial as one would expect that countries with larger populations would naturally have more people infected by an epidemic since viruses are socially transmitted and the eventual toll would depend on how many people live in a country.

Nevertheless, one might be concerned that a small population in a country may increase the intensity of the epidemic as well as the intensity of the epidemic affecting the population counts (through both mortality and immigration). We, therefore, checked the robustness of our results using population *unadjusted* treatment variable: simply the number of individuals affected by an epidemic averaged over the 8 years when the individual was aged 18–25. The results presented in Appendix Tables A5 and A6 show that our results are robust to this alternative definition.

In addition, in Appendix Tables A7 and A8, we show that our results remain qualitatively identical when we use the treatment variable adjused by a time-invariant population size (that is, using a population measure as of 1970).

4.9. Heterogeneity by the country characteristics

We consider the baseline specification (Column 3 of Table 1) for two subsamples: (i) countries with below and above median physicians per capita at the time of the epidemic; (ii) low-income countries vs. high-income countries. We report these results in Appendix Table A9, where each cell reports point estimates for a different outcome varible.

The negative impact of epidemic exposure on trust in scientists seems to be driven by countries with below median physicians per capita at the time of the epidemic and low-income countries. This pattern is in line with evidence from Aksoy et al. (2020), who find that people in the low-income countries more likely to see their governments and leaders less trustworthy and unreliable when they are exposed to epidemics during their impressionable years.

4.10. Are the results driven by the intensive or extensive margin?

In Appendix Table A10, we distinguish the intensive and extensive margins of the treatment. For the extensive margin, we mean whether the effect is due to any level of epidemic exposure. To capture this, we construct a binary variable based on whether the number of people affected by epidemics during the individual's impressionable years is positive or zero. For the intensive margin, we limit the sample to individuals with positive epidemic exposure in their impressionable years.

Appendix Table A10 shows that the treatment works via the intensive margin. It is not simply being exposed to an epidemic that generates the effect; rather, conditional on being exposed, the severity of the epidemic drives the results.

4.11. Are large epidemics different?

As shown in Appendix Table A10, the effects we identify are driven by intensive margin. To further investigate this, in Appendix Table A11, we use indicators for the top 0.5% of exposures to epidemics, the top 1%, the top 2%, and the top 5%, each in a separate estimation. An epidemic exposure in the scale of top 0.5, 1, or 2% of all past experiences causes a significant fall in an individual's confidence in scientists. Moreover, the magnitude of the effect tends to increase with more intense experiences.

4.12. Excluding potential "bad controls"

One might worry that certain individual characteristics (such as household income) are themselves affected by epidemic related economic shocks. We therefore checked for potential "bad controls" (Angrist and Pischke, 2009) by excluding these individual characterisitics. Doing so does not substantively change the point estimates for our variables of interest (see Appendix Table A12).[16]

4.13. Robustness to controlling for the number of epidemic experience

Table A13 shows that our results are robust to controlling for the number of epidemics experienced by individuals over their lifetime.

4.14. Robustness to excluding most affected countries

To check whether our results are driven by a small set of countries, we exclude the most affected countries and reestimate our main models. The results presented in Appendix Table A14 show that our results remain robust.

5. Discussion

COVID-19 has the potential to reshape every aspect of society, including how science and scientists are perceived. It is not clear, however, whether trust in science and scientists will be enhanced or diminished, or whether such changes will affect mainly science as an endeavor or scientists as individuals.

If past epidemics are a guide, the virus will not have an impact on the regard in which science as an undertaking is held. Members of the public will continue to believe that science has the potential to improve society. However, it will reduce trust in individual scientists, worsen perceptions of their honesty, and weaken the belief that their activities benefit the public. This distinction is consistent with the literatures in psychology and cognitive science on how individuals assign blame in complex, high-stakes social settings and with their tendency to blame individuals rather than institutions (see e.g. Wright, 1993; Wilinson-Ryan, 2020). It is consistent with what we observe in, inter alia, the United States, where politicians and commentators have questioned the value of the public-policy recommendations offered by individual scientists (viz. Senator Rand Paul's comment "As much as I respect you, Dr. Fauci, I

[16] We therefore keep these controls in our baseline specification to avoid omitted variable bias.

don't think you're the end-all") while at the same time seeking to mobilize all available scientific resources to develop a vaccine (the Trump Administration's "Operation Warp Speed").

Whether evidence from past epidemics provide an accurate guide to the likely effects on trust in scientists of COVID-19 can be questioned of course. The spread of COVID-19 is global, where some past epidemics were limited to a handful of countries. COVID-19 is arguably the first epidemic to occur in the era of widespread social media, which may have an effect on the spread of misinformation as well as information and on the formulation of opinions. We cannot speak definitively to this question of external validity. Our results in this paper however hold for epidemics that strike multiple countries as well as for those that are limited to a small number of countries.

The State of Science Index (2018) survey suggests that scientists are distrusted because they are seen as members of the elite. It suggests individuals feel that scientists, being self-interested and human, can be unduly influenced by government and corporate agendas, or because they feel that scientists' conclusions are based on personal beliefs and data. Our finding that past epidemic exposure negatively affects views of scientists working for private companies but not as much of scientists working for universities suggests that suspicion of corporate agendas is especially salient in this connection. That epidemic exposure affects views of scientists but not of science is consistent with this emphasis on investigator agendas and beliefs, insofar as bias due to self interest more plausibly skews results when a study is undertaken by an individual than a large team, in the latter case cancelling out individual biases (Dieckmann and Johnson, 2019). Still other surveys find that a significant share of respondents take disagreement among scientists, which is not unlikely in the context of a swiftly unfolding pandemic, as evidence that their conclusions are based on personal belief (rather than on issues of data and methodology), or as simply indicating that the investigators in question are incompetent.

Addressing concerns about corporate agendas, personal bias and disagreement in scientific communication is even more important in this light. Our results suggest that it is especially important to tailor any such response to the concerns expressed by members of the generation ("Generation Z") currently in their impressionable years.

Appendix A

See Tables A1–A18.

Table A1
Robustness to Controlling for Other Economic, Education Related and Political Shocks.

	(1)	(2)
Outcome →	Trust in scientists	Trust in scientists
Exposure to epidemic (18–25)	−1.548***	−1.839***
	(0.528)	(0.570)
Observations	30,666	30,666
Outcome →	Scientists working for private companies benefit the public	Scientists working for private companies benefit the public
Exposure to epidemic (18–25)	−0.738	−0.837
	(1.030)	(1.167)
Observations	30,273	30,273
Outcome →	Scientists working for private companies are honest	Scientists working for private companies are honest
Exposure to epidemic (18–25)	−2.001***	−2.465***
	(0.387)	(0.573)
Observations	28,789	28,789
Outcome →	Scientists working for universities benefit the public	Scientists working for universities benefit the public
Exposure to epidemic (18–25)	−2.616***	−2.684***
	(0.634)	(0.748)
Observations	30,067	30,067
Outcome →	Scientists working for universities are honest	Scientists working for universities are honest
Exposure to epidemic (18–25)	−4.007***	−3.841***
	(1.183)	(1.214)
Observations	28,437	28,437
Outcome →	Scientists find out accurate information	Scientists find out accurate information
Exposure to epidemic (18–25)	−1.551***	−0.974**
	(0.373)	(0.456)
Observations	30,980	30,980
Country fixed effects	Yes	Yes
Cohort fixed effects	Yes	Yes
Demographic characteristics	Yes	Yes
Income quintile fixed effects	Yes	Yes
Labour market controls	Yes	Yes
Country-specific age trends	Yes	Yes
Past controls (18–25)	No	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table A2
Robustness to Omitted Variable Bias.

Dependent variable:	(1) Trust in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
Exposure to Epidemic (18–25)	−3.454**	−1.283***	−1.731***	−0.616	−3.330***	−1.438**
	(1.330)	(0.338)	(0.642)	(0.478)	(0.446)	(0.664)
Bounds on the treatment effect (δ = 1, Rmax = 1.3*R)	(-3.454, −3.044)	(-1.238, −1.134)	(-1.731, −2.301)	(-0.616, 0.649)	(-3.330, −2.587)	(-1.438, −0.827)
Treatment effect excludes 0	Yes	Yes	Yes	Yes	Yes	Yes
Delta (Rmax = 1.3*R)	−44.41	−132.15	13.52	−1.97	−39.39	−5.367

Notes: *** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level. Bounds on the Democracy 18–25 effect are calculated using Stata code psacalc, which calculates estimates of treatment effects and relative degree of selection in linear models as proposed in Oster (2019). Delta, δ, calculates an estimate of the proportional degree of selection given a maximum value of the R-squared. Delta is assumed to be 1 in the analysis, which means that the observed and the unobserved factors have an equally important effect on the coefficient of interest. Rmax specifies the maximum R-squared which would result if all unobservables were included in the regression. We define Rmax upper bound as 1.3 times the R-squared from the main specification that controls for all observables.

Table A3
The Impact of Exposure to Epidemic on Trust in Scientists During Formative Years (18–25) vs. During Other Years.

Outcome →	(1) Trust in scientists	(2) Trust in scientists	(3) Trust in scientists	(4) Trust in scientists	(5) Trust in scientists
Exposure to Epidemic (18–25)	−3.454**	−4.433**	−3.086**	−2.361***	−6.326***
	(1.330)	(1.915)	(1.184)	(0.836)	(1.023)
Exposure to Epidemic (2–9)		−0.044			
		(0.990)			
Exposure to Epidemic (10–17)			0.078		
			(0.942)		
Exposure to Epidemic (26–33)				−0.753	
				(1.152)	
Exposure to Epidemic (34–42)					−0.932
Observations	82,854	58,284	71,109	60,943	42,018
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes
Demographic characteristics	Yes	Yes	Yes	Yes	Yes
Income quintile fixed effects	Yes	Yes	Yes	Yes	Yes
Labour market controls	Yes	Yes	Yes	Yes	Yes
Country-specific age trends	Yes	Yes	Yes	Yes	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A4
Multiple Hypothesis Testing on Variables Related to Trust in Scientists.

Randomization-c p-values (joint test of treatment significance)	0.005***
Randomization-t p-values (joint test of treatment significance)	N/A
Randomization-c p-values (Westfall-Young multiple testing of treatment significance)	0.037**
Randomization-t p-values (Westfall-Young multiple testing of treatment significance)	0.020**

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Randomization-t technique does not produce p-values for the joint test of treatment significance. Results are derived from 100 iterations. Specification is Column 3 of Table 1. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017.

Table A5
Robustness to Using Population Unadjusted Treatment Variable - Trust in Scientists.

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome → Trust in scientists						
Exposure to Epidemic (18–25)$_{nopop.}$	−0.067	−0.060	−0.095**	−0.089**	−0.079*	−0.093**
	(0.042)	(0.043)	(0.043)	(0.043)	(0.044)	(0.042)
Observations	85,746	85,586	85,586	85,586	85,586	85,586
Outcome → Scientists working for private companies benefit the public						
Exposure to Epidemic (18–25)$_{nopop.}$	−0.043*	−0.045*	−0.060***	−0.057***	−0.048**	−0.058***
	(0.026)	(0.024)	(0.017)	(0.020)	(0.021)	(0.017)
Observations	84,228	84,080	84,080	84,080	84,080	84,080
Outcome → Scientists working for private companies are honest						
Exposure to Epidemic (18–25)$_{nopop.}$	−0.092***	−0.093***	−0.096***	−0.105***	−0.086***	−0.091***
	(0.025)	(0.025)	(0.013)	(0.014)	(0.016)	(0.015)
Observations	79,312	79,179	79,179	79,179	79,179	79,179
Outcome → Scientists working for universities benefit the public						
Exposure to Epidemic (18–25)$_{nopop.}$	0.031	0.034	−0.037*	−0.044*	−0.034	−0.041**
	(0.024)	(0.024)	(0.022)	(0.023)	(0.024)	(0.020)
Observations	83,930	83,770	83,770	83,770	83,770	83,770
Outcome → Scientists working for universities are honest						
Exposure to Epidemic (18–25)$_{nopop.}$	−0.106***	−0.101***	−0.143***	−0.148***	−0.139***	−0.144***
	(0.030)	(0.031)	(0.023)	(0.024)	(0.027)	(0.022)
Observations	78,540	78,409	78,409	78,409	78,409	78,409
Outcome → Scientists to find out accurate information						
Exposure to Epidemic (18–25)$_{nopop.}$	−0.022	−0.012	−0.060	−0.078*	−0.047	−0.066
	(0.040)	(0.044)	(0.042)	(0.042)	(0.045)	(0.042)
Observations	86,857	86,692	86,692	86,692	86,692	86,692
Country fixed effects	Yes	Yes	Yes	No	No	No
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic characteristics	No	Yes	Yes	Yes	Yes	Yes
Income quintile fixed effects	No	Yes	Yes	No	Yes	Yes
Labour market controls	No	Yes	Yes	Yes	No	Yes
Country-specific age trends	No	No	Yes	Yes	Yes	Yes
Country*Income fixed effects	No	No	No	Yes	No	No
Country*Empl. fixed effects	No	No	No	No	Yes	No
Country*Educ. fixed effects	No	No	No	No	No	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A6
Robustness to Using Population Unadjusted Treatment Variable - Trust in Science and Placebo Outcomes.

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome → Have trust in science						
Exposure to Epidemic (18–25)$_{nopop.}$	−0.000	0.009	−0.025	−0.039	−0.009	−0.028
	(0.031)	(0.032)	(0.043)	(0.040)	(0.044)	(0.043)
Observations	88,129	87,960	87,960	87,960	87,960	87,960
Outcome → Science and technology will help improve life						
Exposure to Epidemic (18–25)$_{nopop.}$	0.013	0.018	−0.004	−0.008	0.003	−0.004
	(0.031)	(0.032)	(0.038)	(0.037)	(0.041)	(0.037)
Observations	89,271	89,083	89,083	89,083	89,083	89,083
Outcome → Studying diseases is a part of science						
Exposure to Epidemic (18–25)$_{nopop.}$	−0.032	−0.026	0.003	−0.005	0.007	0.008
	(0.026)	(0.025)	(0.024)	(0.023)	(0.024)	(0.025)
Observations	91,104	90,916	90,916	90,916	90,916	90,916
Outcome → Have trust in doctors and nurses						
Exposure to Epidemic (18–25)$_{nopop.}$	0.083**	0.083**	0.079	0.076	0.073*	0.073*
	(0.037)	(0.037)	(0.042)	(0.047)	(0.042)	(0.044)
Observations	95,061	94,870	94,870	94,870	94,870	94,870
Outcome → Have trust in hospitals and health clinics						
Exposure to Epidemic (18–25)$_{nopop.}$	0.077**	0.074**	0.117***	0.122***	0.104***	0.115***
	(0.036)	(0.034)	(0.022)	(0.025)	(0.023)	(0.023)
Observations	92,985	92,806	92,806	92,806	92,806	92,806
Outcome → Have trust in traditional healers						
Exposure to Epidemic (18–25)$_{nopop.}$	0.042	0.034	−0.010	−0.015	−0.022	−0.008
	(0.042)	(0.041)	(0.019)	(0.025)	(0.018)	(0.019)
Observations	90,775	90,594	90,594	90,594	90,594	90,594
Country fixed effects	Yes	Yes	Yes	No	No	No
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic characteristics	No	Yes	Yes	Yes	Yes	Yes
Income quintile fixed effects	No	Yes	Yes	No	Yes	Yes
Labour market controls	No	Yes	Yes	Yes	No	Yes
Country-specific age trends	No	No	Yes	Yes	Yes	Yes
Country*Income fixed effects	No	No	No	Yes	No	No
Country*Empl. fixed effects	No	No	No	No	Yes	No
Country*Educ. fixed effects	No	No	No	No	No	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A7
Robustness to Using Treatment Variable with a Fixed Population in 1970 - Trust in Scientists.

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome → Trust in scientists						
Exposure to Epidemic (18–25)$_{pop70}$	−1.277	−1.226	−1.546**	−1.521*	−1.402*	−1.567**
	(0.825)	(0.848)	(0.745)	(0.783)	(0.797)	(0.780)
Observations	83,014	82,854	82,854	82,854	82,854	82,854
Outcome → Scientists working for private companies benefit the public						
Exposure to Epidemic (18–25)$_{pop70}$	−0.743***	−0.750***	−0.624***	−0.611***	−0.530**	−0.645***
	(0.173)	(0.177)	(0.156)	(0.194)	(0.226)	(0.179)
Observations	81,554	81,406	81,406	81,406	81,406	81,406
Outcome → Scientists working for private companies are honest						
Exposure to Epidemic (18–25)$_{pop70}$	−0.989***	−0.996***	−0.811***	−0.895***	−0.716***	−0.820***
	(0.226)	(0.227)	(0.261)	(0.266)	(0.207)	(0.259)
Observations	76,856	76,723	76,723	76,723	76,723	76,723
Outcome → Scientists working for universities benefit the public						
Exposure to Epidemic (18–25)$_{pop70}$	0.112	0.145	−0.261	−0.350*	−0.232	−0.347*
	(0.345)	(0.358)	(0.194)	(0.192)	(0.205)	(0.185)
Observations	81,307	81,147	81,147	81,147	81,147	81,147
Outcome → Scientists working for universities are honest						
Exposure to Epidemic (18–25)$_{pop70}$	−1.367***	−1.334***	−1.515***	−1.563***	−1.455***	−1.527***
	(0.260)	(0.279)	(0.166)	(0.172)	(0.175)	(0.176)
Observations	76,123	75,992	75,992	75,992	75,992	75,992
Outcome → Scientists to find out accurate information						
Exposure to Epidemic (18–25)$_{pop70}$	−0.526	−0.447	−0.581*	−0.783**	−0.455	−0.695*
	(0.487)	(0.555)	(0.342)	(0.345)	(0.373)	(0.376)
Observations	84,104	83,939	83,939	83,939	83,939	83,939
Country fixed effects	Yes	Yes	Yes	No	No	No
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic characteristics	No	Yes	Yes	Yes	Yes	Yes
Income quintile fixed effects	No	Yes	Yes	No	Yes	Yes
Labour market controls	No	Yes	Yes	Yes	No	Yes
Country-specific age trends	No	No	Yes	Yes	Yes	Yes
Country*Income fixed effects	No	No	No	Yes	No	No
Country*Empl. fixed effects	No	No	No	No	Yes	No
Country*Educ. fixed effects	No	No	No	No	No	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A8
Robustness to Using Treatment Variable with a Fixed Population in 1970 - Trust in Science and Placebo Outcomes.

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome → Have trust in science						
Exposure to Epidemic (18–25)$_{pop70}$	0.073	0.133	0.112	−0.036	0.255	0.069
	(0.231)	(0.281)	(0.188)	(0.212)	(0.190)	(0.191)
Observations	85,368	85,199	85,199	85,199	85,199	85,199
Outcome → Science and technology will help improve life						
Exposure to Epidemic (18–25)$_{pop70}$	0.290*	0.338**	0.360	0.334	0.398	0.345
	(0.151)	(0.155)	(0.213)	(0.228)	(0.209)	(0.212)
Observations	0.041	0.049	0.052	0.064	0.067	0.060
Outcome → Studying diseases is a part of science						
Exposure to Epidemic (18–25)$_{pop70}$	0.005	0.043	0.139	0.040	0.184	0.167
	(0.259)	(0.219)	(0.192)	(0.147)	(0.177)	(0.183)
Observations	88,326	88,138	88,138	88,138	88,138	88,138
Outcome → Have trust in doctors and nurses						
Exposure to Epidemic (18–25)$_{pop70}$	0.693	0.706	0.829*	0.774	0.791*	0.752
	(0.541)	(0.533)	(0.471)	(0.556)	(0.438)	(0.496)
Observations	92,026	91,835	91,835	91,835	91,835	91,835
Outcome → Have trust in hospitals and health clinics						
Exposure to Epidemic (18–25)$_{pop70}$	0.421	0.435	0.714	0.793	0.607	0.678
	(0.652)	(0.604)	(0.531)	(0.633)	(0.499)	(0.557)
Observations	90,030	89,851	89,851	89,851	89,851	89,851
Outcome → Have trust in traditional healers						
Exposure to Epidemic (18–25)$_{pop70}$	0.130	0.090	−0.294	−0.278	−0.453*	−0.271
	(0.475)	(0.433)	(0.264)	(0.250)	(0.233)	(0.258)
Observations	87,942	87,761	87,761	87,761	87,761	87,761
Country fixed effects	Yes	Yes	Yes	No	No	No
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic characteristics	No	Yes	Yes	Yes	Yes	Yes
Income quintile fixed effects	No	Yes	Yes	No	Yes	Yes
Labour market controls	No	Yes	Yes	Yes	No	Yes
Country-specific age trends	No	No	Yes	Yes	Yes	Yes

(*continued on next page*)

Table A8 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
Country*Income fixed effects	No	No	No	Yes	No	No
Country*Empl. fixed effects	No	No	No	No	Yes	No
Country*Educ. fixed effects	No	No	No	No	No	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A9
The Impact of Exposure to Epidemic (18–25) on Confidence in Scientists – Country Level Heterogeneity.

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to out accurate information
Sample → Countries with below median physicians per capita at the time of the epidemic						
Exposure to Epidemic (18–25)	−2.538**	−0.941	−1.290	−1.480***	−3.821***	−1.500***
	(1.198)	(0.704)	(1.880)	(0.477)	(0.920)	(0.389)
Observations	23,471	22,897	21,429	22,657	21,188	23,457
Sample → Countries with above median physicians per capita at the time of the epidemic						
Exposure to Epidemic (18–25)	8.534	3.150	23.543	3.551	−2.854	−10.120
	(8.792)	(19.549)	(19.378)	(17.570)	(20.983)	(15.787)
Observations	24,971	24,950	23,849	24,936	23,538	25,752
Sample → Countries with below median-income at the time of the epidemic						
Exposure to Epidemic (18–25)	−3.385**	−1.205***	−2.169***	−0.653	−3.238***	−0.833
	(1.399)	(0.416)	(0.747)	(0.642)	(0.615)	(0.611)
Observations	32,979	32,195	30,127	31,915	29,857	33,153
Sample → Countries with above median-income at the time of the epidemic						
Exposure to Epidemic (18–25)	−16.196	−11.317	0.243	−18.143	−22.066	−26.570*
	(19.432)	(20.752)	(16.352)	(11.706)	(12.233)	(13.173)
Observations	34,116	33,929	32,465	33,963	32,155	34,984

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Specification is Column 3 of Table 1.Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A10
The Impact of Exposure to Epidemic (18–25) on Trust in Scientists - Intensive and Extensive Margins.

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
Intensive margin						
Exposure to Epidemic (18–25)	−3.762*	−1.870***	−2.354**	−2.782	−4.154***	−1.807***
	(2.233)	(0.389)	(0.983)	(1.986)	(0.916)	(0.348)
Observations	35,807	34,932	32,912	34,673	32,542	35,805
Extensive margin						
Exposure to Epidemic (18–25)	0.001	−0.005	0.007	−0.002	0.001	−0.003
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
Observations	82,854	81,406	76,723	81,147	75,992	83,939
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Income quintile fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Labour market controls	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific age trends	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A11
The Impact of Exposure to Epidemic (18–25) on Trust in Scientists by Exposure Thresholds.

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
Top 0.5 per cent (Exposure to Epidemic, 18–25)	−0.274***	−0.188***	−0.134***	0.008	−0.134***	0.008
	(0.014)	(0.015)	(0.016)	(0.014)	(0.016)	(0.014)
Observations	27,212	26,639	25,102	26,644	25,102	26,644
Top 1 per cent (Exposure to Epidemic, 18–25)	−0.125	−0.011	−0.136***	−0.018	−0.136***	−0.018
	(0.085)	(0.093)	(0.013)	(0.018)	(0.013)	(0.018)
Observations	27,212	26,639	25,102	26,644	25,102	26,644
Top 2 per cent (Exposure to Epidemic, 18–25)	−0.134**	−0.113**	−0.089*	−0.108	−0.089*	−0.108
	(0.058)	(0.056)	(0.052)	(0.066)	(0.052)	(0.066)
Observations	27,212	26,639	25,102	26,644	25,102	26,644
Top 5 per cent (Exposure to Epidemic, 18–25)	−0.024	0.029	0.043	0.009	0.043	0.009
	(0.030)	(0.026)	(0.031)	(0.027)	(0.031)	(0.027)
Observations	27,212	26,639	25,102	26,644	25,102	26,644

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Specification is Column 3 of Table 1. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A12
Robustness to Excluding Potentially "Bad Controls"

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
Exposure to Epidemic (18–25)	−3.544***	−1.296***	−1.767***	−0.703	−3.365***	−1.626***
	(1.344)	(0.337)	(0.601)	(0.465)	(0.455)	(0.616)
Observations	83,014	81,554	76,856	81,307	76,123	84,104
Outcome →	(1) Have trust in science	(2) Science and technology will help improve life	(3) Studying diseases is a part of science	(4) Have trust in doctors and nurses	(5) Have trust in hospitals and health clinics	(6) Have trust in traditional healers
Exposure to Epidemic (18–25)	0.114	0.561	0.247	1.557	1.314	−0.615
	(0.402)	(0.471)	(0.446)	(1.222)	(1.389)	(0.545)
Observations	85,368	86,585	88,326	92,026	90,030	87,942
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Male dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific age trends	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A13
Robustness to Controlling for the Number of Epidemic Experience.

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
Exposure to Epidemic (18–25)	−3.454**	−1.283***	−1.731***	−0.616	−3.330***	−1.438**
	(1.330)	(0.338)	(0.642)	(0.478)	(0.446)	(0.664)
The number of epidemics exp.	−0.193***	−0.178***	−0.146***	−0.189***	−0.223***	−0.297***
	(0.007)	(0.006)	(0.006)	(0.004)	(0.006)	(0.005)
Observations	82,854	81,406	76,723	81,147	75,992	83,939

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Specification is Column 3 of Table 1. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A14
Robustness to Excluding Most Affected Countries (i.e. excluding top 5 percentile).

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
Exposure to Epidemic (18–25)	−3.427**	−1.326***	−1.965***	−0.580	−3.269***	−1.413**
	(1.351)	(0.313)	(0.489)	(0.463)	(0.451)	(0.667)
Observations	79,223	77,719	73,214	77,537	72,531	80,286
	(1)	(2)	(3)	(4)	(5)	(6)
Outcome →	Have trust in science	Science and technology will help improve life	Studying diseases is a part of science	Have trust in doctors and nurses	Have trust in hospitals and health clinics	Have trust in traditional healers
Exposure to Epidemic (18–25)	0.122	0.551	0.189	1.569	1.290	−0.711
	(0.468)	(0.473)	(0.364)	(1.235)	(1.360)	(0.528)
Observations	81,346	82,578	84,246	87,743	85,761	83,696

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Specification is Column 3 of Table 1.Source: The most affected countries are * Madagascar, Philippines, Niger, Zimbabwe, Bolivia, Chad, and Republic of Congo. Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A15
The Impact of Exposure to Epidemic (18–25) on Confidence in Scientists – Exploring the Role of Media.

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
Exposure to Epidemic (18–25)	−14.230**	−8.094***	−20.589***	−8.239	−22.039**	−3.383
	(7.009)	(2.589)	(5.054)	(5.618)	(8.671)	(6.349)
Exposure to Epidemic (18–25)*TV Per Capita (18–25)	−0.002	0.001	−0.000	0.000	−0.002	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Exposure to Epidemic (18–25)*Radio Per Capita (18–25)	0.012	0.001	0.007	−0.000	0.013	0.004
	(0.009)	(0.003)	(0.006)	(0.005)	(0.011)	(0.008)
TV Per Capita (18–25)	−0.000	−0.000	0.000	0.000	−0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Radio Per Capita (18–25)	−0.000	−0.000	0.000	−0.000***	0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	28,085	27,889	26,453	27,746	26,150	28,471

Notes: Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Specification is Column 3 of Table 1.Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A16
Robustness to Ordered Logit Estimation.

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
Exposure to Epidemic (18–25)	22300***	66.00***	301.81***	104.13*	2646.74***	92.46***
	(95100)	(92.37)	(520.52)	(278.16)	(5196.73)	(416.19)
Observations	82,854	81,406	76,723	81,147	75,792	83,939
	(1)	(2)	(3)	(4)	(5)	(6)
Outcome →	Have trust in science	Science and technology will help improve life	Studying diseases is a part of science	Have trust in doctors and nurses	Have trust in hospitals and health clinics	Have trust in traditional healers
Exposure to Epidemic (18–25)	2.050	0.002	0.023	0.011	0.000	0.770
	(6.791)	(0.010)	(0.090)	(0.062)	(0.042)	(6.013)
Observations	85,199	86,397	88,138	91,835	89,851	87,761
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Male dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific age trends	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Odds ratios are reported (an odds ratio greater than 1 indicates a positive association and an odds ratio less than 1 indicates a negative association). Outcomes "Confidence in scientists", "Scientists working for private companies benefit the public", "Scientists working for private companies are honest", " Scientists working for universities benefit the public", " Scientists working for universities are honest", "Scientists to find out accurate information", "Have trust in science", "Have trust in doctors and nurses", "Have trust in traditional healers" are coded as (1) a lot, (2) some, (3) not much, (4) not at all. Outcomes "Science and technology will help improve life", "Studying diseases is a part of science" and "Have trust in hospitals and health clinics" are coded as (1) yes, 2 (no). Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A17
Robustness to Multinomial Logit Estimation.

Outcome →	(1) Confidence in scientists	(2) Scientists working for private companies benefit the public	(3) Scientists working for private companies are honest	(4) Scientists working for universities benefit the public	(5) Scientists working for universities are honest	(6) Scientists to find out accurate information
(2) Exposure to Epidemic (18–25)	64370.22	0.000**	0.000*	192.841	28700***	0.073
	(628762.5)	(0.000)	(0.001)	(1051.95)	(13100)	(0.407)
(3) Exposure to Epidemic (18–25)	153000***	0.331	8.244	3065.431**	60954.08***	117.29
	(735000)	(0.829)	(24.318)	(10000.84)	(110188)	(632.23)
(4) Exposure to Epidemic (18–25)	30200***	9.997	144.46*	0.227	0.214	424.53***
	(10900)	(49.451)	(380.651)	(1.547)	(1.470)	(2863.42)
Observations	82,854	81,406	76,723	81,147	75,792	83,939
	(1)	(2)	(3)	(4)	(5)	(6)
Outcome →	Have trust in science	Science and technology will help improve life	Studying diseases is a part of science	Have trust in doctors and nurses	Have trust in hospitals and health clinics	Have trust in traditional healers
(2) Exposure to Epidemic (18–25)	95.00	0.002	0.023	176.00	0.000	45700***
	(379.78)	(0.010)	(0.090)	(721.90)	(0.042)	(34900)
(3) Exposure to Epidemic (18–25)	5.240	–	–	0.024	–	54200***
	(18.20)			(0.178)		(35800)
(4) Exposure to Epidemic (18–25)	0.113	–	–	13900**	–	29,600
	(0.874)			(13400)		(46100)
Observations	85,199	86,397	88,138	91,835	89,851	87,761

Notes: Relative risk (probability) ratios are reported (a relative risk ratio greater than 1 indicates a positive association and a relative risk ratio less than 1 indicates a negative association). Outcomes "Confidence in scientists", "Scientists working for private companies benefit the public", "Scientists working for private companies are honest", " Scientists working for universities benefit the public", " Scientists working for universities are honest", "Scientists to find out accurate information", "Have trust in science", "Have trust in doctors and nurses", "Have trust in traditional healers" are coded as (1) a lot, (2) some, (3) not much, (4) not at all. Outcomes "Science and technology will help improve life", "Studying diseases is a part of science" and "Have trust in hospitals and health clinics" are coded as (1) yes, 2 (no). Category 1 (i.e., "a lot" option) used for the baseline comparison group. Specification is Column 3 of Table 1. Results use the Gallup sampling weights and robust standard errors are clustered at the country level. Source: Wellcome Global Monitor, 2018 and EM-DAT International Disaster Database, 1970–2017. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A18
Full List of Epidemics from the EM-DAT Database.

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Afghanistan	1998	cholera	15,783	185
Afghanistan	1999	cholera	20,702	135
Afghanistan	2000	cholera	2228	50
Afghanistan	2001	cholera	4425	154
Afghanistan	2002	leishmaniasis	206,834	102
Afghanistan	2005	cholera	3245	0
Afghanistan	2008	cholera	1100	17
Albania	1996	poliovirus	66	7
Albania	2002	unknown	226	0
Algeria	1991	typhiod	204	0
Algeria	1997	typhiod	364	1
Angola	1987	cholera	673	59
Angola	1989	cholera	15,525	766
Angola	1995	meningitis	1007	0
Angola	1998	meningitis	1113	115
Angola	1999	poliovirus	873	188
Angola	2000	meningitis	117	18
Angola	2001	meningitis	420	39
Angola	2004	marburg virus	45	329
Angola	2006	cholera	57,570	2354
Angola	2007	cholera	18,343	515
Angola	2008	cholera	17,437	363
Angola	2009	diarrhoeal syndrome	25,938	116
Angola	2015	yellow fever	4599	384
Angola	2018	cholera	139	2
Argentina	1992	cholera	3883	67
Argentina	2009	dengue and dengue haemorrhagic fever	13,366	6
Australia	2002	sars	6	0
Australia	2016	dengue and dengue haemorrhagic fever	2016	0
Bangladesh	1977	cholera	10,461	260
Bangladesh	1982	cholera	173,460	2696
Bangladesh	1986	water-borne diseases	52,000	165
Bangladesh	1987		601,200	750
Bangladesh	1991		1,608,000	2700
Bangladesh	1993		5660	38
Bangladesh	1995		21,236	400
Bangladesh	1996		10,000	20
Bangladesh	1997		14,330	64
Bangladesh	1998		185,000	151
Bangladesh	2000		26,214	31
Bangladesh	2002		49,904	96
Bangladesh	2004	nipah viral disease	54	32
Bangladesh	2007	cholera	284,910	86
Bangladesh	2017	diphteria	789	15
Belarus	1995		282	13
Belarus	1997		605	0
Belgium	1945	poliovirus	104	0
Benin	1976	poliovirus	7	1
Benin	1987		403	65
Benin	1989		2411	228
Benin	1996	yellow fever	21	65
Benin	1997		226	47
Benin	1998		527	78
Benin	1999	diarrhoeal syndrome	241	9
Benin	2000	meningitis	7762	351
Benin	2001	meningitis	9760	378
Benin	2002		452	50
Benin	2003	cholera	265	3
Benin	2005	cholera	206	4
Benin	2008	cholera	988	33
Benin	2010	cholera	1037	25
Benin	2013	cholera	486	6
Benin	2016	cholera	678	13
Benin	2019	meningitis	24	13
Bhutan	1985		247	41
Bhutan	1992	cholera	494	0
Bolivia	1969	poliovirus	77	18
Bolivia	1989	yellow fever	97	67
Bolivia	1991	cholera	17,665	329
Bolivia	1997	cholera	734	18
Bolivia	1998	cholera	165	5
Bolivia	1999	yellow fever	68	33
Bolivia	2007	dengue and dengue haemorrhagic fever	228	1
Bolivia	2008	dengue and dengue haemorrhagic fever	7202	27

Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Bolivia	2010	dengue and dengue haemorrhagic fever	25,236	29
Bolivia	2018	h1n1	1428	23
Bosnia and Herzegovina	2000	hepatitis a	400	0
Botswana	1988		14,618	183
Botswana	2006	diarrhoeal syndrome	22,264	470
Botswana	2008	cholera	15	2
Brazil	1974		30,000	1500
Brazil	1975		107	0
Brazil	1986	dengue and dengue haemorrhagic fever	34,722	0
Brazil	1988		170	0
Brazil	1991	cholera	15,240	196
Brazil	1995	dengue and dengue haemorrhagic fever	112,939	2
Brazil	1997		25,900	0
Brazil	1998	dengue and dengue haemorrhagic fever	214,340	13
Brazil	1999	cholera	235	3
Brazil	2002	dengue and dengue haemorrhagic fever	317,730	57
Brazil	2008	dengue and dengue haemorrhagic fever	162,701	123
Brazil	2009	dengue and dengue haemorrhagic fever	126,139	23
Brazil	2010	dengue and dengue haemorrhagic fever	942,153	0
Brazil	2016	yellow fever	777	261
Brazil	2017	yellow fever	310	154
Burkina Faso	1969	meningitis	4550	304
Burkina Faso	1979		1612	241
Burkina Faso	1981		10,013	1091
Burkina Faso	1983	yellow fever	386	237
Burkina Faso	1984		1000	0
Burkina Faso	1996		40,967	4135
Burkina Faso	1997		17,996	2274
Burkina Faso	1998	cholera	441	26
Burkina Faso	2001	meningitis	20,820	2978
Burkina Faso	2003	meningitis	7146	1058
Burkina Faso	2004	meningitis	2783	527
Burkina Faso	2005	cholera	606	9
Burkina Faso	2006	meningitis	7402	784
Burkina Faso	2007	meningitis	20,765	1490
Burkina Faso	2008	measles	53,000	550
Burkina Faso	2009	meningitis	2892	389
Burkina Faso	2010	meningitis	5960	841
Burkina Faso	2017	dengue and dengue haemorrhagic fever	9029	18
Burundi	1978	cholera	1530	54
Burundi	1992		2068	220
Burundi	1997	typhus	24,350	21
Burundi	1999		616,434	80
Burundi	2000		730,691	308
Burundi	2002		2163	87
Burundi	2003	cholera	230	6
Burundi	2011	cholera	600	12
Burundi	2016	cholera	193	1
Cabo Verde	1994	cholera	12,344	245
Cabo Verde	2009	dengue and dengue haemorrhagic fever	20,147	6
Cambodia	1992		380,400	50
Cambodia	1997	dengue and dengue haemorrhagic fever	227	3
Cambodia	1998	dengue and dengue haemorrhagic fever	15,069	490
Cambodia	1999	cholera	874	56
Cambodia	2006	dengue and dengue haemorrhagic fever	4368	0
Cambodia	2007	dengue and dengue haemorrhagic fever	17,000	182
Cameroon	1988		340	39
Cameroon	1989		550	100
Cameroon	1990	yellow fever	172	118
Cameroon	1991	cholera	1343	308
Cameroon	1992		7865	731
Cameroon	1993		4070	513
Cameroon	1996	cholera	2825	378
Cameroon	1997	shigellosis	479	109
Cameroon	1998	cholera	2086	239
Cameroon	1999		105	14
Cameroon	2000	meningitis	65	22
Cameroon	2001	meningitis	542	31
Cameroon	2004	cholera	2924	46
Cameroon	2005	cholera	1400	42
Cameroon	2006	cholera	71	8
Cameroon	2009	cholera	1456	109
Cameroon	2010	cholera	7869	515
Cameroon	2011	cholera	16,706	639
Cameroon	2014	cholera	2056	111

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Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Cameroon	2015	measles	858	0
Cameroon	2018	cholera	942	57
Canada	1918	h1n1	2,000,000	50,000
Canada	1953	poliovirus	8000	481
Canada	1991		171	18
Canada	2001	cryptosporidiosis	399	1
Canada	2002	sars	347	45
Central African Republic	1992		418	56
Central African Republic	1999		86	14
Central African Republic	2000		2572	448
Central African Republic	2001	meningitis	1473	343
Central African Republic	2002	hepatitis e	727	6
Central African Republic	2003	shigellosis	379	23
Central African Republic	2011	cholera	172	16
Central African Republic	2013	measles	63	0
Central African Republic	2016	cholera	266	21
Central African Republic	2018	hepatitis e	119	1
Central African Republic	2019	measles	3600	53
Chad	1971	cholera	7476	2312
Chad	1988		6794	433
Chad	1991	cholera	12,204	1262
Chad	1996	cholera	1317	94
Chad	1997		2835	239
Chad	2000	meningitis	9673	1209
Chad	2001	cholera	3444	113
Chad	2003	cholera	131	11
Chad	2004	cholera	3567	144
Chad	2005		6000	115
Chad	2006	cholera	216	20
Chad	2008	hepatitis e	1755	22
Chad	2009	meningitis	871	102
Chad	2010	measles	5319	239
Chad	2011	cholera	18,123	557
Chad	2012	meningitis	1708	88
Chad	2017	cholera	652	58
Chad	2018	measles	4227	90
Chile	1991	cholera	40	1
China	1987	rotavirus	1000	0
China	1988		2000	0
China	2002	sars	6652	369
China	2004	h5n1	9	16
China	2005	septicaemia	168	38
Colombia	1991	cholera	14,137	350
Colombia	1996	cholera	3000	62
Colombia	2012	dengue and dengue haemorrhagic fever	23,235	0
Colombia	2013	dengue and dengue haemorrhagic fever	1171	91
Colombia	2016	yellow fever	12	0
Colombia	2019	dengue and dengue haemorrhagic fever	79,639	169
Comoros (the)	1989	typhiod	450	3
Comoros (the)	1998	cholera	3200	40
Comoros (the)	1999	cholera	140	14
Comoros (the)	2005	chikungunya	2282	0
Comoros (the)	2007	cholera	1490	29
Congo (the Dem.Rep.)	1976	ebola	262	245
Congo (the Dem.Rep.)	1996	cholera	1954	202
Congo (the Dem.Rep.)	1997	cholera	1411	54
Congo (the Dem.Rep.)	1998	cholera	13,884	972
Congo (the Dem.Rep.)	1999	marburg virus	72	3
Congo (the Dem.Rep.)	2000		63	26
Congo (the Dem.Rep.)	2001	cholera	11,094	838
Congo (the Dem.Rep.)	2002	h1n1	539,375	2502
Congo (the Dem.Rep.)	2003	cholera	20,401	786
Congo (the Dem.Rep.)	2004	typhiod	46,220	406
Congo (the Dem.Rep.)	2005	cholera	4872	101
Congo (the Dem.Rep.)	2006	cholera	2986	151
Congo (the Dem.Rep.)	2007	ebola	419	172
Congo (the Dem.Rep.)	2009	cholera	15,909	209
Congo (the Dem.Rep.)	2010	cholera	4342	56
Congo (the Dem.Rep.)	2011	cholera	28,757	636
Congo (the Dem.Rep.)	2012	cholera	23,626	608
Congo (the Dem.Rep.)	2014	ebola	17	49
Congo (the Dem.Rep.)	2016	measles	2638	55
Congo (the Dem.Rep.)	2017	cholera	1022	43
Congo (the Dem.Rep.)	2018	ebola	3454	2297
Congo (the Dem.Rep.)	2019	measles	277,000	5872

Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Congo (the)	1997	cholera	485	83
Congo (the)	1999	cholera	99	15
Congo (the)	2001	ebola	13	19
Congo (the)	2002	ebola	15	128
Congo (the)	2003	ebola	2	29
Congo (the)	2005	ebola	2	10
Congo (the)	2006	cholera	3030	50
Congo (the)	2008	cholera	630	26
Congo (the)	2010	poliovirus	524	219
Congo (the)	2011	chikungunya	10,819	65
Congo (the)	2012		57	5
Congo (the)	2013	cholera	1071	16
Congo (the)	2019	measles	208,246	3819
Costa Rica	1995	dengue and dengue haemorrhagic fever	4786	0
Costa Rica	2013	dengue and dengue haemorrhagic fever	12,000	3
Costa Rica	2019	dengue and dengue haemorrhagic fever	4852	0
Cuba	1993	neuromyelopathy	49,358	0
Cuba	1997	dengue and dengue haemorrhagic fever	823	3
Cyprus	1996	meningitis	280	0
Côte d'Ivoire	1970	cholera	1500	120
Côte d'Ivoire	1991	cholera	50	16
Côte d'Ivoire	1995	cholera	2027	150
Côte d'Ivoire	2001	cholera	3180	196
Côte d'Ivoire	2002	cholera	861	77
Côte d'Ivoire	2005		210	40
Côte d'Ivoire	2006	cholera	451	42
Côte d'Ivoire	2007	meningitis	150	30
Côte d'Ivoire	2017	dengue and dengue haemorrhagic fever	621	2
Djibouti	1994	cholera	239	10
Djibouti	1997	cholera	827	29
Djibouti	1998		2000	43
Djibouti	2000	cholera	419	4
Djibouti	2007	cholera	562	6
Dominican Republic (the)	1995	dengue and dengue haemorrhagic fever	1252	2
Dominican Republic (the)	2009	dengue and dengue haemorrhagic fever	3270	25
Dominican Republic (the)	2010	cholera	17,321	130
Dominican Republic (the)	2011	cholera	220	1
Dominican Republic (the)	2012	cholera	26,090	167
Dominican Republic (the)	2019	dengue and dengue haemorrhagic fever	16,907	34
Ecuador	1967	poliovirus	528	36
Ecuador	1969	encephalitis syndrome (aes)	40,000	400
Ecuador	1977	typhiod	300	0
Ecuador	1991	cholera	15,131	343
Ecuador	1995	dengue and dengue haemorrhagic fever	3399	0
Ecuador	1998	cholera	11	1
Ecuador	2000		100,220	8
Ecuador	2002	unknown	100	0
Ecuador	2010	dengue and dengue haemorrhagic fever	4000	4
Ecuador	2012	dengue and dengue haemorrhagic fever	6967	11
Egypt	2004	hepatitis a	143	15
El Salvador	1969	encephalitis syndrome (aes)	19	12
El Salvador	1991	cholera	5625	155
El Salvador	1992	cholera	350	0
El Salvador	1995	dengue and dengue haemorrhagic fever	9296	5
El Salvador	1998	dengue and dengue haemorrhagic fever	1670	0
El Salvador	2000	dengue and dengue haemorrhagic fever	211	24
El Salvador	2002	dengue and dengue haemorrhagic fever	2399	6
El Salvador	2003	pneumonia	50,000	304
El Salvador	2009	dengue and dengue haemorrhagic fever	4598	7
El Salvador	2014	dengue and dengue haemorrhagic fever	12,783	4
El Salvador	2019	dengue and dengue haemorrhagic fever	16,573	5
Equatorial Guinea	2004		946	15
Ethiopia	1970	cholera	4000	500
Ethiopia	1980	dysentery	25,000	157
Ethiopia	1981		50,000	990
Ethiopia	1985	cholera	4815	1101
Ethiopia	1988		41,304	7400
Ethiopia	1999		276	9
Ethiopia	2000	meningitis	7033	371
Ethiopia	2001	meningitis	8166	429
Ethiopia	2005		964	74
Ethiopia	2006	diarrhoeal syndrome	32,848	351
Ethiopia	2008	diarrhoeal syndrome	3134	20
Ethiopia	2009	cholera	13,652	135
Ethiopia	2010	diarrhoeal syndrome	967	16

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Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Ethiopia	2013	yellow fever	288	110
Ethiopia	2018	measles	4000	0
Ethiopia	2019	cholera	1916	39
Fiji	2019	measles	14	0
France	2002	sars	6	1
Gabon	1988	cholera	132	0
Gabon	1996	ebola	15	45
Gabon	2001	ebola	10	50
Gabon	2004	typhiod	100	1
Gabon	2007	chikungunya	17,900	0
Gabon	2010	chikungunya	551	0
Gambia (the)	1997		793	120
Gambia (the)	2000	meningitis	116	21
Germany	2002		609	0
Ghana	1977	cholera	6558	0
Ghana	1984		1500	103
Ghana	1988		138	15
Ghana	1989		19	0
Ghana	1996		3757	411
Ghana	1997		159	26
Ghana	1998	cholera	1546	67
Ghana	1999	diarrhoeal syndrome	1196	24
Ghana	2001		1141	12
Ghana	2005	cholera	2248	40
Ghana	2010	meningitis	100	27
Ghana	2011	cholera	10,002	101
Ghana	2012	cholera	5441	76
Ghana	2013	cholera	560	18
Ghana	2014	cholera	56,469	249
Ghana	2015	meningitis	465	85
Ghana	2016	cholera	172	0
Guatemala	1969	encephalitis syndrome (aes)	8	4
Guatemala	1991	cholera	26,800	180
Guatemala	1995	dengue and dengue haemorrhagic fever	3402	0
Guatemala	1998	cholera	1345	17
Guatemala	2002	dengue and dengue haemorrhagic fever	2042	1
Guatemala	2013	dengue and dengue haemorrhagic fever	1977	8
Guatemala	2015	chikungunya	15,211	0
Guatemala	2019	dengue and dengue haemorrhagic fever	6264	17
Guinea	1987		30	18
Guinea	1999	cholera	123	12
Guinea	2000	yellow fever	322	190
Guinea	2001	cholera	143	12
Guinea	2002		123	23
Guinea	2003	yellow fever	43	24
Guinea	2006	cholera	298	129
Guinea	2007	cholera	2410	90
Guinea	2012	cholera	5523	105
Guinea	2013	measles	143	0
Guinea	2014	ebola	3814	2544
Guinea	2017	measles	122	0
Guinea-Bissau	1987	cholera	6000	68
Guinea-Bissau	1996	cholera	26,967	961
Guinea-Bissau	1997	cholera	22,299	781
Guinea-Bissau	1999		2169	404
Guinea-Bissau	2008	cholera	14,004	221
Haiti	1963		2724	0
Haiti	2003	typhiod	200	40
Haiti	2010	cholera	513,997	6908
Haiti	2012	cholera	5817	50
Haiti	2014	chikungunya	39,343	0
Haiti	2015	cholera	20,000	170
Haiti	2016	cholera	6096	0
Honduras	1965	poliovirus	170	7
Honduras	1995	dengue and dengue haemorrhagic fever	15,998	5
Honduras	1998	cholera	2452	17
Honduras	2002	dengue and dengue haemorrhagic fever	4530	8
Honduras	2009	dengue and dengue haemorrhagic fever	11,771	7
Honduras	2010	dengue and dengue haemorrhagic fever	27,000	67
Honduras	2013	dengue and dengue haemorrhagic fever	34,128	27
Honduras	2019	dengue and dengue haemorrhagic fever	71,216	128
Hong Kong	2002	sars	1456	299
India	1967		13,576	3029
India	1977	cholera	9091	0
India	1978		1000	48

Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
India	1984	dysentery	27,000	3290
India	1985		6589	854
India	1986		11,600	265
India	1990	diarrhoeal syndrome	18,000	90
India	1994	pneumonia	5150	53
India	1996	dengue and dengue haemorrhagic fever	8423	354
India	1997		890	80
India	1998	cholera	15,238	807
India	1999		79,504	281
India	2000		1851	191
India	2001	cholera	58,889	89
India	2002		5153	50
India	2003	dengue and dengue haemorrhagic fever	2185	0
India	2005	chikungunya	155,813	640
India	2009	encephalitis syndrome (aes)	1521	311
India	2019	dengue and dengue haemorrhagic fever	1318	121
Indonesia	1968	bubonic	94	40
Indonesia	1977	cholera	29,942	37
Indonesia	1978	cholera	70	11
Indonesia	1982	cholera	200	39
Indonesia	1984		4000	105
Indonesia	1986		500,700	59
Indonesia	1991		15,000	170
Indonesia	1996	dengue and dengue haemorrhagic fever	5373	117
Indonesia	1998	dengue and dengue haemorrhagic fever	32,665	777
Indonesia	1999	dengue and dengue haemorrhagic fever	4645	56
Indonesia	2000	dengue and dengue haemorrhagic fever	1719	25
Indonesia	2002	shigellosis	759	17
Indonesia	2004	dengue and dengue haemorrhagic fever	58,322	745
Indonesia	2005	poliovirus	329	0
Indonesia	2007	dengue and dengue haemorrhagic fever	35,211	403
Iran (Islamic Republic of)	1965	cholera	2500	288
Iraq	1978	cholera	51	1
Iraq	1997		185	0
Iraq	2007	cholera	4696	24
Iraq	2008	cholera	892	11
Iraq	2015	cholera	2217	0
Ireland	2000		1374	2
Ireland	2002	sars	1	0
Israel	2000	west nile fever	139	12
Italy	2002		10,001	3
Jamaica	1990	typhiod	300	0
Jamaica	2006		280	3
Japan	1977	cholera	74	1
Japan	1978	h1n1	2,000,000	0
Japan	1997	campylobacter	460	0
Jordan	1981	cholera	715	4
Kazakhstan	1998		593	7
Kazakhstan	1999	typhus	166	0
Kazakhstan	2000	typhus	114	0
Kenya	1991		200	26
Kenya	1994		6,500,000	1000
Kenya	1997	cholera	33,036	932
Kenya	1998	cholera	1025	27
Kenya	1999		329,570	1814
Kenya	2000	cholera	721	50
Kenya	2001		743	40
Kenya	2004		141	8
Kenya	2005		1645	53
Kenya	2006	rift valley fever	588	170
Kenya	2009	cholera	10,446	251
Kenya	2010	cholera	3880	57
Kenya	2014	cholera	3459	72
Kenya	2017	cholera	4421	76
Kenya	2019	cholera	3847	26
Korea (the Republic of)	1969	cholera	1538	137
Korea (the Republic of)	1998	shigellosis	350	0
Korea (the Republic of)	2000		39,531	6
Korea (the Republic of)	2002	sars	3	0
Korea (the Republic of)	2015	mers	185	36
Kuwait	2002	sars	1	0
Kyrgyzstan	1997		336	22
Kyrgyzstan	1998	typhiod	458	0
Kyrgyzstan	2010	poliovirus	141	0
Lao People's Dem. Rep.	1987	dengue and dengue haemorrhagic fever	2000	63

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Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Lao People's Dem. Rep.	1994	cholera	8000	500
Lao People's Dem. Rep.	1995	cholera	244	34
Lao People's Dem. Rep.	2000		9685	0
Lao People's Dem. Rep.	2013	dengue and dengue haemorrhagic fever	36,000	77
Latvia	2000	diphteria	102	0
Lesotho	1974	typhiod	500	0
Lesotho	1999	dysentery	1862	28
Lesotho	2000		1834	28
Liberia	1980	cholera	1887	466
Liberia	1995	yellow fever	359	9
Liberia	1998	diarrhoeal syndrome	560	12
Liberia	2000	cholera	112	3
Liberia	2002	diarrhoeal syndrome	661	0
Liberia	2003	cholera	19,418	0
Liberia	2005	cholera	674	29
Liberia	2014	ebola	10,682	4810
Macao	2002	sars	1	0
Macedonia FYR	2002	unknown	200	0
Madagascar	1999	cholera	18,228	981
Madagascar	2002	h1n1	21,975	671
Madagascar	2008	rift valley fever	520	20
Madagascar	2009	chikungunya	702	0
Madagascar	2013	pneumonia	660	113
Madagascar	2017	plague	2384	207
Madagascar	2018	measles	98,415	0
Malawi	1989		444	35
Malawi	1997		622	10
Malawi	2000	cholera	3323	83
Malawi	2001	cholera	40,266	1131
Malawi	2002	cholera	773	41
Malawi	2006	cholera	852	20
Malawi	2008	cholera	5269	113
Malawi	2009	measles	11,461	62
Malawi	2014	cholera	693	11
Malawi	2017	cholera	450	6
Malaysia	1968	cholera	5	2
Malaysia	1977	typhiod	50	0
Malaysia	1991	dengue and dengue haemorrhagic fever	3750	263
Malaysia	1996	dengue and dengue haemorrhagic fever	5407	13
Malaysia	1997	dengue and dengue haemorrhagic fever	21,684	78
Malaysia	1998	encephalitis syndrome (aes)	160	105
Malaysia	2000	enterovirus	988	4
Malaysia	2002	sars	3	2
Maldives	1978	cholera	11,258	219
Maldives	2011	dengue and dengue haemorrhagic fever	1289	4
Mali	1969		4023	513
Mali	1979		80	30
Mali	1981		4153	412
Mali	1984	cholera	4502	1022
Mali	1987	yellow fever	305	145
Mali	1988		159	47
Mali	1996	meningitis	2208	345
Mali	1997		9666	1098
Mali	2002		282	33
Mali	2003	cholera	1216	106
Mali	2005	cholera	168	43
Mali	2006		151	9
Mali	2009	meningitis	86	10
Mali	2011	cholera	1190	49
Mali	2014	ebola	7	6
Mauritania	1982		12	5
Mauritania	1987	yellow fever	178	35
Mauritania	1988	cholera	575	38
Mauritania	1998	rift valley fever	344	6
Mauritania	2005	cholera	2585	55
Mauritius	1980	typhiod	108	0
Mauritius	2005	chikungunya	2553	0
Mexico	1991	cholera	5000	52
Mexico	1995	dengue and dengue haemorrhagic fever	6525	16
Mexico	2009	dengue and dengue haemorrhagic fever	41,687	0
Moldova	1999		1647	0
Mongolia	1996	cholera	108	8
Mongolia	2002	sars	9	0
Mongolia	2008	enterovirus	3151	0
Morocco	1966	meningitis	2942	200

Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Mozambique	1980	cholera	200	10
Mozambique	1983	cholera	5679	189
Mozambique	1990	cholera	4000	588
Mozambique	1992	cholera	225,673	587
Mozambique	1997	cholera	27,201	637
Mozambique	1998	cholera	2600	209
Mozambique	2000		18,583	11
Mozambique	2001	cholera	611	7
Mozambique	2002	cholera	2028	17
Mozambique	2003	cholera	24,134	159
Mozambique	2006	cholera	5692	27
Mozambique	2007	cholera	7547	78
Mozambique	2008	cholera	19,310	155
Mozambique	2009	cholera	19,776	198
Mozambique	2010	cholera	3188	44
Mozambique	2011	cholera	325	13
Mozambique	2013	cholera	317	2
Mozambique	2014	cholera	5118	43
Mozambique	2017	cholera	1799	1
Mozambique	2019	cholera	3577	0
Myanmar	1983		800	10
Namibia	2000	meningitis	58	14
Namibia	2001		12,098	134
Namibia	2006	poliovirus	47	10
Namibia	2007	cholera	250	7
Namibia	2008	cholera	203	9
Namibia	2013	cholera	518	17
Nepal	1963		5000	1000
Nepal	1967	bubonic	24	17
Nepal	1982		1475	0
Nepal	1990	cholera	3800	150
Nepal	1991	diarrhoeal syndrome	45,341	1334
Nepal	1992	diarrhoeal syndrome	50,000	640
Nepal	1995	encephalitis syndrome (aes)	772	126
Nepal	1996	encephalitis syndrome (aes)	697	118
Nepal	1997	encephalitis syndrome (aes)	1364	84
Nepal	1998	encephalitis syndrome (aes)	300	52
Nepal	1999	encephalitis syndrome (aes)	944	150
Nepal	2000	encephalitis syndrome (aes)	592	69
Nepal	2001	diarrhoeal syndrome	242	13
Nepal	2009	diarrhoeal syndrome	58,874	314
Nepal	2010	diarrhoeal syndrome	5372	73
Netherlands (the)	1999	legionellosis	200	13
New Zealand	2002	sars	1	0
Nicaragua	1967		444	53
Nicaragua	1991	cholera	381	2
Nicaragua	1995	dengue and dengue haemorrhagic fever	13,406	18
Nicaragua	1998	cholera	3356	7
Nicaragua	2009	dengue and dengue haemorrhagic fever	2050	8
Nicaragua	2010	leptospirosis	395	16
Nicaragua	2013	dengue and dengue haemorrhagic fever	1310	3
Nicaragua	2019	dengue and dengue haemorrhagic fever	94,513	15
Niger (the)	1969	yellow fever	5	2
Niger (the)	1970		2677	319
Niger (the)	1989		1785	186
Niger (the)	1991		90,147	2842
Niger (the)	1995		63,691	3022
Niger (the)	1996		10,475	882
Niger (the)	1997		2156	262
Niger (the)	1999		741	49
Niger (the)	2000		1151	190
Niger (the)	2001		48,067	573
Niger (the)	2002	meningitis	3306	316
Niger (the)	2003		1861	195
Niger (the)	2004		20,132	154
Niger (the)	2005	cholera	387	44
Niger (the)	2006	meningitis	784	62
Niger (the)	2008	meningitis	2805	173
Niger (the)	2009	meningitis	4513	169
Niger (the)	2010	meningitis	1217	103
Niger (the)	2011	cholera	2130	48
Niger (the)	2012	cholera	4874	97
Niger (the)	2014	meningitis	1639	153
Niger (the)	2015	measles	3370	6
Niger (the)	2016	rift valley fever	78	23

(*continued on next page*)

Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Niger (the)	2017	meningitis	2390	118
Niger (the)	2018	cholera	3824	78
Nigeria	1969	yellow fever	80,000	2000
Nigeria	1986	yellow fever	1400	1073
Nigeria	1987		120	100
Nigeria	1989	haemorrhagic fever syndrome	41	29
Nigeria	1991	cholera	11,200	7689
Nigeria	1996	cerebro spinal	42,586	5539
Nigeria	1998	acute neurological syndrome	211	39
Nigeria	1999	diarrhoeal syndrome	2977	486
Nigeria	2000	cholera	1255	87
Nigeria	2001	cholera	2636	204
Nigeria	2002	diarrhoeal syndrome	3903	229
Nigeria	2004	cholera	1897	172
Nigeria	2005		23,873	619
Nigeria	2008	unknown	66	46
Nigeria	2009	meningitis	35,255	1701
Nigeria	2010	cholera	43,287	1872
Nigeria	2011	cholera	21,382	694
Nigeria	2012	haemorrhagic fever syndrome	29	10
Nigeria	2014	cholera	36,017	763
Nigeria	2015	cholera	2108	97
Nigeria	2016	meningitis	15,432	1287
Nigeria	2017	cholera	1704	11
Nigeria	2018	haemorrhagic fever syndrome	1081	90
Nigeria	2019	measles	22,834	98
Nigeria	2020	haemorrhagic fever syndrome	365	47
Pakistan	1968	cholera	1075	37
Pakistan	1998	cholera	9917	83
Pakistan	2000	diarrhoeal syndrome	258	14
Pakistan	2001	leishmaniasis	5000	0
Pakistan	2002	unknown	25	10
Pakistan	2004		100	2
Pakistan	2005	tetanos	111	22
Pakistan	2017	dengue and dengue haemorrhagic fever	2492	25
Pakistan	2019	dengue and dengue haemorrhagic fever	53,834	95
Palestine, State of	1983		943	0
Panama	1964		1200	0
Panama	1991	cholera	2057	43
Panama	1995	dengue and dengue haemorrhagic fever	2124	1
Panama	2002	meningitis	173	0
Papua New Guinea	2001		1395	0
Papua New Guinea	2002		2215	122
Papua New Guinea	2009	h1n1	7391	192
Paraguay	1999	dengue and dengue haemorrhagic fever	2273	0
Paraguay	2006	dengue and dengue haemorrhagic fever	100,000	17
Paraguay	2008	dengue and dengue haemorrhagic fever	5957	8
Paraguay	2009	dengue and dengue haemorrhagic fever	24	8
Paraguay	2010	dengue and dengue haemorrhagic fever	13,681	0
Paraguay	2011	dengue and dengue haemorrhagic fever	16,264	44
Paraguay	2020	dengue and dengue haemorrhagic fever	106,127	20
Peru	1991	cholera	283,353	1726
Peru	1997	cholera	174	1
Peru	1998	cholera	33,763	16
Peru	2009	dengue and dengue haemorrhagic fever	14,151	0
Peru	2010	dengue and dengue haemorrhagic fever	31,703	13
Peru	2012	dengue and dengue haemorrhagic fever	20,106	11
Peru	2016	yellow fever	54	26
Philippines (the)	1977		681	57
Philippines (the)	1990		200	21
Philippines (the)	1996	dengue and dengue haemorrhagic fever	1673	30
Philippines (the)	1998	dengue and dengue haemorrhagic fever	11,000	202
Philippines (the)	1999	dengue and dengue haemorrhagic fever	402	10
Philippines (the)	2000	diarrhoeal syndrome	664	1
Philippines (the)	2002	sars	12	2
Philippines (the)	2004	meningitis	98	32
Philippines (the)	2010	dengue and dengue haemorrhagic fever	123,939	737
Philippines (the)	2011	dengue and dengue haemorrhagic fever	7595	56
Philippines (the)	2012	cholera	3158	30
Philippines (the)	2018	dengue and dengue haemorrhagic fever	79,376	519
Philippines (the)	2019	dengue and dengue haemorrhagic fever	129,597	825
Romania	1996		527	0
Romania	1999		4743	0
Romania	2002	sars	1	0
Russian Federation	1995		150,000	0

Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Russian Federation	1997	haemorrhagic fever syndrome	4538	0
Russian Federation	1999	west nile fever	765	33
Russian Federation	2000	acute jaundice syndrome	2942	0
Russian Federation	2002	sars	1	0
Rwanda	1978	cholera	2000	0
Rwanda	1991		214	32
Rwanda	1996	cholera	106	10
Rwanda	1998	cholera	2951	55
Rwanda	1999		488	76
Rwanda	2000	meningitis	164	10
Rwanda	2002	meningitis	636	83
Rwanda	2004	typhiod	540	4
Rwanda	2006	cholera	300	35
Sao Tome and Principe	1989	cholera	1063	31
Sao Tome and Principe	2005	cholera	1349	25
Saudi Arabia	2000	rift valley fever	497	133
Saudi Arabia	2001	meningitis	74	35
Senegal	1965	yellow fever	150	60
Senegal	1978	cholera	298	5
Senegal	1985	cholera	3100	300
Senegal	1995	cholera	3031	188
Senegal	1998		2709	372
Senegal	2002		181	18
Senegal	2004	cholera	861	6
Senegal	2005	cholera	23,022	303
Senegal	2007	cholera	2825	16
Senegal	2014	ebola	1	0
Seychelles	2005	chikungunya	5461	0
Seychelles	2016	dengue and dengue haemorrhagic fever	253	0
Sierra Leone	1985	cholera	3000	352
Sierra Leone	1996	haemorrhagic fever syndrome	953	226
Sierra Leone	1997	h1n1	2024	51
Sierra Leone	1998	cholera	1770	55
Sierra Leone	1999	dysentery	3228	133
Sierra Leone	2001	meningitis	3	12
Sierra Leone	2003	yellow fever	90	10
Sierra Leone	2004	cholera	633	56
Sierra Leone	2008	cholera	1746	170
Sierra Leone	2012	cholera	23,009	300
Sierra Leone	2014	ebola	14,124	3956
Singapore	1998	encephalitis syndrome (aes)	11	1
Singapore	2000	enterovirus	2022	2
Singapore	2002	sars	205	33
Singapore	2016	dengue and dengue haemorrhagic fever	13,051	0
Solomon Islands	2013	dengue and dengue haemorrhagic fever	6700	8
Solomon Islands	2016	dengue and dengue haemorrhagic fever	1212	0
Somalia	1977		2671	0
Somalia	1985	cholera	4815	1262
Somalia	1986	cholera	7093	1307
Somalia	1994		17,000	100
Somalia	1996	cholera	5557	247
Somalia	1997	cholera	1044	0
Somalia	1998	cholera	14,564	481
Somalia	1999	cholera	175	15
Somalia	2000	cholera	2490	244
Somalia	2001	meningitis	111	33
Somalia	2002	cholera	1191	63
Somalia	2005	poliovirus	199	0
Somalia	2006		5876	103
Somalia	2007	cholera	35,687	1133
Somalia	2008	cholera	663	13
Somalia	2016	cholera	14,165	497
Somalia	2017	cholera	13,126	302
South Africa	2000	cholera	86,107	181
South Africa	2002	cholera	13,352	84
South Africa	2004	cholera	174	5
South Africa	2008	cholera	12,752	65
South Sudan	2013	poliovirus	3	0
South Sudan	2014	cholera	6486	149
South Sudan	2015	cholera	1818	47
South Sudan	2016	cholera	3826	68
South Sudan	2019	measles	937	7
Spain	1997	meningitis	1383	0
Spain	2001	legionellosis	751	2
Spain	2002	sars	1	0

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Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Sri Lanka	1967		200,000	2
Sri Lanka	1977	cholera	728	0
Sri Lanka	1997	cholera	1695	36
Sri Lanka	1999		5936	1
Sri Lanka	2000	dengue and dengue haemorrhagic fever	113	2
Sri Lanka	2004	dengue and dengue haemorrhagic fever	15,000	88
Sri Lanka	2009	dengue and dengue haemorrhagic fever	35,007	346
Sri Lanka	2011	dengue and dengue haemorrhagic fever	26,343	167
Sri Lanka	2017	dengue and dengue haemorrhagic fever	155,715	320
Sri Lanka	2019	dengue and dengue haemorrhagic fever	18,760	28
Sudan (the)	1940	yellow fever	15,000	1500
Sudan (the)	1950		72,162	0
Sudan (the)	1965		2300	0
Sudan (the)	1976	ebola	299	150
Sudan (the)	1988		38,805	2770
Sudan (the)	1996	cholera	1800	700
Sudan (the)	1998	meningitis	22,403	1746
Sudan (the)	1999	cholera	3959	357
Sudan (the)	2000		2363	186
Sudan (the)	2002	leishmaniasis	1281	49
Sudan (the)	2003	yellow fever	178	27
Sudan (the)	2004	hepatitis e	8114	98
Sudan (the)	2005	meningitis	7454	650
Sudan (the)	2006	cholera	28,769	1142
Sudan (the)	2007	meningitis	7639	584
Sudan (the)	2008	diarrhoeal syndrome	212	15
Sudan (the)	2012	yellow fever	678	171
Sudan (the)	2016		632	19
Sudan (the)	2017	diarrhoeal syndrome	30,762	657
Sudan (the)	2019	cholera	510	24
Swaziland	1992	cholera	2228	30
Swaziland	2000	cholera	1449	32
Sweden	2002	diarrhoeal syndrome	350	0
Switzerland	2002	sars	1	0
Syrian Arab Rep.	1977	cholera	4165	88
Taiwan (Prov. of China)	1998	encephalitis syndrome (aes)	250,000	54
Taiwan (Prov. of China)	2002	sars	309	37
Tajikistan	1996	typhiod	7516	0
Tajikistan	1997	typhiod	15,618	168
Tajikistan	1999	typhiod	200	3
Tajikistan	2003	typhiod	256	0
Tajikistan	2010	poliovirus	456	21
Tanzania	1977	cholera	6050	500
Tanzania	1985	bubonic	118	10
Tanzania	1987	cholera	500	90
Tanzania	1991		1733	284
Tanzania	1992	cholera	40,249	2231
Tanzania	1997	cholera	42,350	2329
Tanzania	1998	cholera	40,677	2461
Tanzania	1999	diarrhoeal syndrome	529	56
Tanzania	2000		898	37
Tanzania	2001	diarrhoeal syndrome	515	25
Tanzania	2002	meningitis	149	9
Tanzania	2005	cholera	576	6
Tanzania	2006	cholera	1410	70
Tanzania	2007	rift valley fever	284	119
Tanzania	2009	cholera	600	12
Tanzania	2015	cholera	37,712	582
Tanzania	2019	cholera	216	3
Thailand	1977	cholera	2800	100
Thailand	2000		1946	89
Thailand	2002	sars	7	2
Thailand	2003	h5n1	4	7
Thailand	2004	h5n1	8	14
Thailand	2010	dengue and dengue haemorrhagic fever	880	2
Thailand	2011	dengue and dengue haemorrhagic fever	37,728	27
Timor-Leste	2005	dengue and dengue haemorrhagic fever	336	22
Timor-Leste	2014	dengue and dengue haemorrhagic fever	197	2
Togo	1988		1617	50
Togo	1996		2619	360
Togo	1998	cholera	3669	239
Togo	2001	meningitis	1567	235
Togo	2002		494	95
Togo	2003	cholera	790	40
Togo	2008	cholera	686	6

Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Togo	2010	meningitis	236	60
Togo	2013	cholera	168	7
Togo	2015	meningitis	324	24
Turkey	1964		2500	19
Turkey	1965		100,000	461
Turkey	1968	poliovirus	1975	98
Turkey	1977		100,000	0
Turkey	1987	cholera	150	11
Turkey	2004	h5n1	8	4
Turkey	2006	haemorrhagic fever syndrome	222	20
Uganda	1982	plague	153	3
Uganda	1986	plague	340	27
Uganda	1989	meningitis	961	156
Uganda	1990	meningitis	1170	197
Uganda	1997	o'nyongnyong fever	100,300	0
Uganda	1998	cholera	600	30
Uganda	1999	cholera	2205	122
Uganda	2000	ebola	723	259
Uganda	2001		9	14
Uganda	2003	cholera	242	35
Uganda	2004	cholera	53	3
Uganda	2005	cholera	726	21
Uganda	2006	meningitis	5702	203
Uganda	2007	hepatitis e	5937	132
Uganda	2008	cholera	388	28
Uganda	2009	cholera	544	17
Uganda	2010	yellow fever	190	48
Uganda	2012	cholera	5980	156
Uganda	2013	cholera	218,497	28
Uganda	2018	cholera	1000	31
Ukraine	1994	cholera	1333	71
Ukraine	1995		5336	204
Ukraine	1997		102	0
United Kingdom	1984	salmonella	16	26
United Kingdom	1985	legionellosis	144	34
United Kingdom	2001	meningitis	30	11
United Kingdom	2002	sars	4	0
USA	1990	encephalitis syndrome (aes)	50	3
USA	1993	cryptosporidiosis	403,000	100
USA	2002	west nile fever	3653	214
Uzbekistan	1998		148	40
Venezuela	1990	dengue and dengue haemorrhagic fever	9506	74
Venezuela	1991	cholera	967	18
Venezuela	1995	dengue and dengue haemorrhagic fever	32,280	0
Venezuela	2010	cholera	118	0
Viet Nam	1964	cholera	10,848	598
Viet Nam	1996	dengue and dengue haemorrhagic fever	9706	45
Viet Nam	1998	dengue and dengue haemorrhagic fever	8000	214
Viet Nam	2002	sars	58	5
Viet Nam	2003	h5n1	8	15
Viet Nam	2004	h5n1	51	42
Viet Nam	2005	acute neurological syndrome	83	16
Viet Nam	2016	dengue and dengue haemorrhagic fever	79,204	27
Yemen	2000	rift valley fever	289	32
Yemen	2005	poliovirus	179	0
Yemen	2015		3026	3
Yemen	2016	cholera	180	11
Yemen	2017	diphteria	298	35
Yemen	2019	cholera	521,028	932
Zambia	1990	yellow fever	667	85
Zambia	1991	cholera	13,154	0
Zambia	1992	cholera	11,659	0
Zambia	1999	cholera	13,083	462
Zambia	2000	cholera	1224	163
Zambia	2001	plague	425	11
Zambia	2003	cholera	3835	179
Zambia	2005	cholera	7615	21
Zambia	2006	cholera	105	5
Zambia	2007	cholera	115	5
Zambia	2008	cholera	8312	173
Zambia	2009	cholera	5198	87
Zambia	2012	cholera	153	2
Zambia	2017	cholera	4371	89
Zimbabwe	1992	cholera	5649	258
Zimbabwe	1996		500,000	1311

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Table A18 (*continued*)

Country	Year	Epidemic	Total no of affected people	Total no of deaths
Zimbabwe	1998	cholera	377	22
Zimbabwe	1999	cholera	462	52
Zimbabwe	2000	cholera	2812	112
Zimbabwe	2002	cholera	452	4
Zimbabwe	2003	cholera	750	40
Zimbabwe	2005	cholera	1183	87
Zimbabwe	2007		10,000	67
Zimbabwe	2008	cholera	98,349	4276
Zimbabwe	2009	measles	1346	55
Zimbabwe	2010	typhiod	258	8
Zimbabwe	2011	cholera	1140	45
Zimbabwe	2014	cholera	11	0
Zimbabwe	2018	typhiod	5164	12

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