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Fear-Based Medical Misinformation and Disease Prevention From Vaccines to Statins

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Prior to 1963, when the measles, mumps, and rubella (MMR) vaccine was licensed, an estimated 3 to 4 million people, mostly children, contracted measles each year. Since then, massive immunization campaigns resulted in the successful elimination of measles in the United States in 2000.¹ However, the subsequent 20 years witnessed a backslide. A small number of parents, more concerned about immunization risks than diseases they had never seen, began to refuse immunization for their children. As a result, geographic clusters of unvaccinated children are now fueling ongoing outbreaks of measles and other vaccine-preventable diseases.²

Why is this happening? Since *Lancet's* now-retracted 1998 publication³ linking MMR vaccine and autism, pediatricians and public health officials have been battling fake news about vaccine safety. Despite a substantial body of research on immunization safety, a small but vocal community of vaccine refusers (commonly termed *antivaxxers*) promote antivaccine literature online. "Wellness" websites spread largely unfounded concerns about vaccine safety, and evidence suggests that Russian Twitter bots amplify their message by spreading antivaccine stories.⁴

While headlines shine the spotlight on vaccine refusal, the same fake medical news and fearmongering also plague the cardiovascular world through relentless attacks on statins. Now websites, books, and even antistatin documentaries spread false information about statins. On 1 popular "health" website,⁵ readers can learn that vaccines cause autism, learning disabilities, and death. This site also incorrectly indicates that statins cause memory loss, cataracts, pancreatic dysfunction, Lou Gehrig disease, and cancer.⁵ Many of these sites criticize statin researchers for links to "big pharma" while simultaneously

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oils, and books, to fearful patients seeking alternatives. Meanwhile, organized groups on Facebook serve as echo chambers for antistatin advocates.

With the exception of a small, vocal minority, most physicians believe that statins, as with vaccines, are safe and effective.⁶ Their beliefs are supported by data from thousands of patients in clinical trials.⁷ Yet many patients remain concerned about statin safety. In 1 study, concerns about statin safety were the leading reason patients reported declining a statin, with more than 1 in 3 patients (37%) citing fears about adverse effects as their reason for not starting a statin after their physician recommended.⁸ Fake news about statins is making this worse. One study demonstrated that at a population level, statin discontinuation increased after negative news stories about statins.⁹ More concerning, fears about statins may cause real problems for patients, manifesting as perceived adverse effects for adults willing to take statins. This *nocebo effect* was elegantly demonstrated in the GAUSS-III study in which the patients with prior statin intolerance were randomized to placebo followed by statin or statin followed by placebo. Fewer than half had recurrent adverse effects on statin but not placebo.¹⁰

Measles outbreaks are highly visible: a rash appears, public health agencies respond, headlines are made, and the medical community responds vocally. In contrast, when a patient who has refused a statin because of concerns stoked by false information has a myocardial infarction, the result is less visible. Nevertheless, cardiologists and primary care physicians observe the smoldering outbreak of statin refusal daily. Given the prevalence of cardiovascular disease, the number of lives lost to inadequate prevention owing to inappropriate concerns about statins could number in the millions.

What can clinicians learn from the pediatric experience in the vaccine world to inform how to manage the tide of antistatin misinformation? First, as with vaccines, researchers must continue to rigorously prove the safety and tolerability of statins. Yet the vaccine experience has also demonstrated that a robust body of safety literature is necessary, but not sufficient, to reassure a doubting public. Behavioral science maintains that when faced with evidence contrary to a strongly held belief, people are more likely to reaffirm their convictions rather than change their mind. Scientists and clinicians, professional societies, and medical journals need to be vocal proponents of evidence-based therapies in social media and public conversations.

Transparency and clear communication to patients is also critical to maintaining trust. When a child receives a vaccine, his or her parent receives a 1-page, easy-to-understand handout called a Vaccine Information Sheet about the immunization including a discussion of its safety profile and why the vaccine is recommended. These are provided extra credibility because they are produced by the US Centers for Disease Control and Prevention. In contrast, the limited information patients receive about pharmaceutical therapies is only delivered after they have already decided to pick up their prescription from the pharmacy. There are real adverse events from statins, and physicians should discuss both these risks and the benefits of statins with their patients. A patient-friendly medication information sheet, inspired by the Vaccine Information Sheet and endorsed by trusted government and patient

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Next, for key high-benefit, low-risk therapies, such as statins, barriers to initiation and persistence of statin therapy should be reduced. Vaccine exemption rates are higher in states with policies that make it easier to get an exemption.² Similarly, inconveniences in access to statin therapy can drive discontinuation. Options to increase initiation and persistence to statins should include extended medication supplies of up to 1 year, automatic refills, \$0 copays, and comprehensive adherence programs.

A theme underlying the mistrust in both statins and vaccines is a general distrust of the pharmaceutical industry. Although most vaccines are generally not high-revenue components of pharmaceutical company portfolios, and most prescribed statins are available as generic products, many antivaccine and antistatin campaigns suggest that pharmaceutical profits, rather than cardiovascular prevention, drive use. Researcher ties to drug companies are cited as reasons to distrust statin-related research. Efforts to restore public trust and confidence in pharmaceutical manufacturers, including reform in drug pricing, broad access to patient support programs, and transparency in research, are critical to maintain patient trust in preventive therapies.

Meanwhile, the medical community needs to stay vigilant. Statins may have been the next target after vaccines, but the epidemic of fake medical news will almost certainly continue to spread to other therapeutic areas. This threatens not only the trust patients have in their medical system, their physicians, and the medical literature but also in the health of the nation.

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