INDUSTRIAL IMMUNITY

INOCULATING THE MANUFACTURING ECONOMY

June 2026

NATIONAL ASSOCIATION OF Manufacturers


P 82

Industrial Immunity:
Inoculating the Manufacturing Economy

June 2026

National Association of Manufacturers

A Strong Manufacturing Workforce

A strong manufacturing sector requires a strong manufacturing workforce—skilled men and women who take pride in their work, support their families and strengthen their communities. Policymakers across the country are focused on pro-growth policies to make America the best place in the world to make things, but these policies can only be realized with a healthy, productive workforce behind them. More than 400,000 manufacturing jobs are currently unfilled, and that number is projected to reach 1.9 million by 2033.[1] To attract new talent and keep the current workforce healthy and on the job, manufacturers rely on preventative health care as vital to workforce strength.

Vaccines are some of America's most significant innovations and strongest preventative health measures. Each year, hundreds of millions of vaccine doses are administered to protect children and adults from dangerous and costly illnesses, such as influenza, measles, whooping cough, meningitis, hepatitis and polio.[2] Decades of research and studies affirm vaccines' safety, efficacy and importance not only in preventing illness but also in averting the long-term health consequences that may follow.

Vaccines help protect workers and their families from illness and the associated long-term consequences—preserving the stability of America's industrial base and thereby strengthening the American economy. Vaccines reduce preventable illnesses and provide measurable economic benefits that extend far beyond reducing medical expenses, including curtailing absenteeism, presenteeism and attrition among manufacturing workers. When workers are healthy, production lines run smoothly, supply chains operate efficiently and the economy grows. When manufacturing workers are sick, delays spread, supply chains strain and impacts are felt outside the shop floor.

A robust vaccination policy is therefore essential to public health and the strength of the American economy. To support the stability and productivity of the manufacturing workforce and preserve U.S. global competitiveness, a clear, predictable policy agenda is essential to support scientifically informed healthcare decisions and encourage sustained investment in research and development.

1 Deloitte and the Manufacturing Institute, "Taking charge: Manufacturers support growth with active workforce strategies," 2024, accessed April 30, 2026, https://themanufacturinginstitute.org/wp-content/uploads/2024/04/Digital_Skills_Report_April_2024.pdf.

2 Centers for Disease Control and Prevention, "Weekly Flu Vaccination Dashboard," accessed April 21, 2026, https://www.cdc.gov/fluvaxview/dashboard/index.html.

Economic Impacts of Reduced Vaccination in the Manufacturing Sector

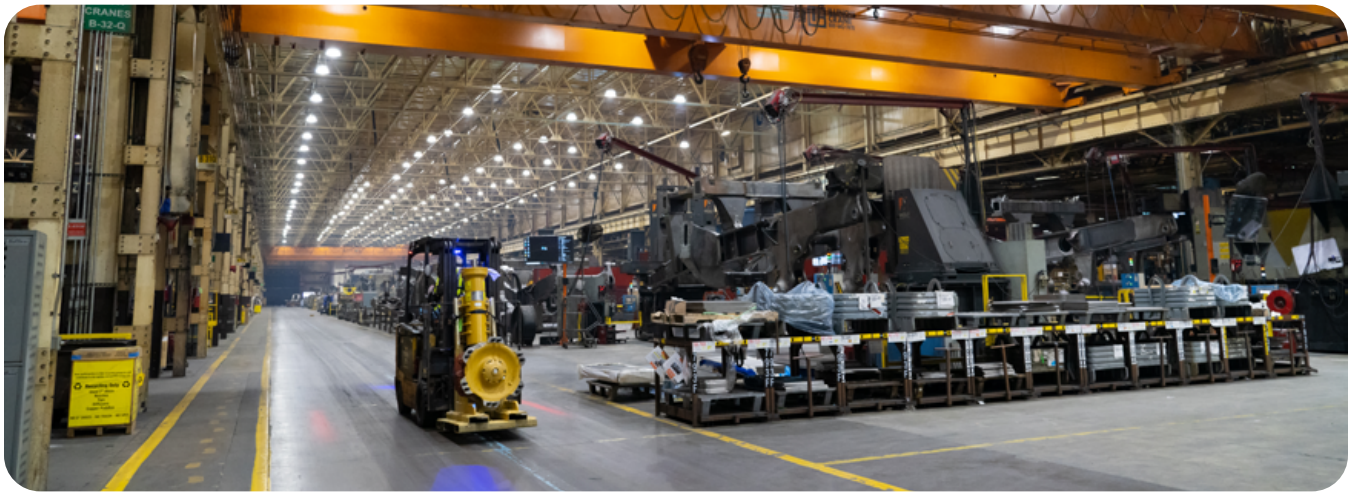
Absenteeism, Presenteeism and Attrition

$225 Billion

Annual cost of absenteeism to U.S. employers

Productivity losses from workers missing shifts, working while sick or leaving the workforce due to illness translate into lost output and disruptions in an industry that relies heavily on consistent staffing and coordinated production processes. Absenteeism represents the most direct and measurable economic costs of worker illness. In 2015, the Centers for Disease Control and Prevention estimated that **productivity losses linked to absenteeism cost U.S. employers $225.8 billion annually,** which translates into nearly $320 billion when adjusted for inflation and **nearly $30 billion for the manufacturing industry alone.**[3] In addition, a survey of managers across industries found that 55% of respondents would have a difficult or impossible time finding a replacement who could equal the productivity of a worker who was absent.[4]

For America's manufacturers, absenteeism carries additional consequences. While the productivity of our workforce is one of our greatest competitive advantages—the United States is a leader in real manufacturing value-added per worker—manufacturing already experiences higher absenteeism and lost worktime rates due to illness than the rest of the private sector.[5] When faced with absenteeism, manufacturers must rely on temporary staffing, incur overtime costs or face slowdowns that can cripple critical supply chains. In some cases, entire lines are shut down if those in specialized positions are absent from a shift.



3 CDC Foundation, "Worker Illness and Injury Costs U.S. Employers $225.8 Billion Annually," Jan. 28, 2015, accessed May 5, 2026, https://www.cdcfoundation.org/pr/2015/worker-illness-and-injury-costs-us-employers-225-billion-annually. NAM calculations adjust dollar values for inflation using the Consumer Price Index from the BLS, https://www.bls.gov/cpi/.

4 C. Strömberg, E. Aboagye, J. Hagberg, G. Bergström and M. Lohela-Karlsson, "Estimating the effect and economic impact of absenteeism, presenteeism, and work environment–related problems on reductions in productivity from a managerial perspective," Value in Health 20, no. 8 (2017): 1058–1064.

5 OECD Structural Analysis Database, accessed May 26, 2026, https://www.oecd.org/en/data/datasets/structural-analysis-database.html. See also U.S. BLS, "Absences from work of employed full-time wage and salary workers by occupation and industry," accessed April 21, 2026, https://www.bls.gov/cps/cpsaat47.html.

$275 Million

Annual cost to U.S. manufacturers associated with declining MMR vaccination rates

These dynamics extend to family members. When the children of manufacturing workers are sick, the costs extend beyond the child that is ill, as parents are forced to miss work to care for them. An NAM analysis of CDC vaccination data, Bureau of Labor Statistics employment statistics and Census survey data of the current population estimates that **declining measles, mumps and rubella vaccination coverage currently costs U.S. manufacturers approximately $275 million per year in lost production from parental caregiving absenteeism** attributable to vaccine-preventable diseases.[6] Additionally, a systematic review of 63 studies on the impact of influenza/influenza-like illness on work productivity found that "approximately 50–75% of employed caregivers miss work to care for household members with influenza or influenza-like illness, for approximately 1 to 2 days on average."[7]

Presenteeism—when employees come to work while sick—represents a less-visible but still costly source of productivity loss for the workforce. Working while sick leads to reduced focus, slower decision-making and an increase in errors and accidents that manufacturers and the economy cannot afford. This has been referred to as a "loss spiral," when employees spend less time recovering from illness and instead engage in presenteeism, making it harder for them to fulfill subsequent job demands.[8] In addition, presenteeism increases illness exposure of other workers, which could lead to further absenteeism or presenteeism.[9]

6 NAM calculations of CDC, National Center for Immunization and Respiratory Diseases, "School Vaccination Assessment Program (SchoolVaxView)," https://www.cdc.gov/schoolvaxview/about/index.html; U.S. BLS, "Current Employment Statistics," https://www.bls.gov/ces/ and "Quarterly Census of Employment and Wages," https://www.bls.gov/cew/; and U.S. Census Bureau and U.S. BLS, "Current Population Survey, Annual Social and Economic Supplement," https://www.census.gov/data/datasets/time-series/demo/cps/cps-asec.html, accessed April 21, 2026.

7 M-H Blanchet Zumofen, J. Frimpter and S. A. Hansen, "Impact of Influenza and Influenza-Like Illness on Work Productivity Outcomes: A Systematic Literature Review," PharmacoEconomics 41 (2023): 253–273, https://doi.org/10.1007/s40273-022-01224-9.

8 Joshua Nowak, Andre Emmermacher, Johannes Wendsche, Antonia-Sophie Döbler and Jürgen Wegge, "Presenteeism and absenteeism in the manufacturing sector: A multilevel approach identifying underlying factors and relations to health," Current Psychology 42 (2022): 18641–18659, https://doi.org/10.1007/s12144-022-03013-1.

9 Ibid.

Research also shows that the costs of presenteeism could be even greater than the costs of absenteeism, accounting for 18% to 60% of total illness-related costs.[10] Presenteeism cost U.S. businesses an estimated $150 billion annually in 2004, which is likely far higher today, and a problem that is underreported and quietly draining productivity.[11] Vaccination plays a pivotal role in reducing presenteeism by lowering both the incidence and severity of illness. The previously mentioned review of 63 studies on influenza and influenza-like illness found that vaccinated employees missed fewer days and spent fewer days working while ill, compared to their unvaccinated peers.[12]

Beyond the immediate disruptions of absenteeism and presenteeism, attrition represents a more permanent erosion of workforce capacity, one in which workers exit or never join the labor force due to hospitalization, chronic illness or death, further compounding the economic strain imposed by lost productivity and diminished performance. In fact, adults with multiple chronic conditions are up to 29% less likely to be employed, and they miss an additional three to nine workdays per year as a result of illness.[13] While not all chronic illnesses can be prevented by vaccination, this is still an illuminating figure.

The economic benefits of vaccination begin in infancy. Healthier children are more likely to have higher labor force participation and occupational success over their lifetimes.[14] Preventing illness and hospitalization in childhood lowers the risk of chronic health complications later on, contributing to a more resilient labor force.[15]

10 R. Z. Goetzel, S. R. Long, R. J. Ozminkowski, K. Hawkins, S. Wang and W. Lynch, "Health, Absence, Disability, and Presenteeism Cost Estimates of Certain Physical and Mental Health Conditions Affecting U.S. Employers," Journal of Occupational and Environmental Medicine 46, no. 4 (April 2004): 398–412, https://doi.org/10.1097/01.jom.0000121151.40413.bd.

11 Paul Hemp, "Presenteeism: At work—but out of it," Harvard Business Review 82, no. 10 (2004): 49–58, accessed April 24, 2026

12 Blanchet Zumofen, et al., "Impact of Influenza and Influenza-Like Illness on Work Productivity Outcomes."

13 B. W. Ward, "Multiple chronic conditions and labor force outcomes: A population study of US adults," American Journal of Industrial Medicine 58, no. 9 (2025): 943–954.

14 Anne Case and Christina Paxson, "The Long Reach of Childhood Health and Circumstance: Evidence from the Whitehall II Study," Economic Journal, Royal Economic Society 121, no. 554 (August 2011): 183–204, https://ideas.repec.org/a/ecj/econjl/v121y2011i554pf183-f204.html. See also Krzysztof Karbownik and Anthony Wray, "Educational, Labor-market and Intergenerational Consequences of Poor Childhood Health," NBER Working Paper Series 26368 (2019), https://doi.org/10.3386/w26368.

15 Debra L Blackwell, Mark D Hayward and Eileen M Crimmins, "Does childhood health affect chronic morbidity in later life?," Social Science & Medicine 52, no. 8 (2001): 1269–1284, ISSN 0277-9536, https://doi.org/10.1016/S0277-9536(00)00230-6.

Among approximately 117 million children born in the United States between 1994 and 2023, routine childhood vaccinations, not including influenza, COVID-19 and RSV, are estimated to have prevented 508 million lifetime cases of illness, 32 million hospitalizations and more than 1.1 million deaths over those children's lifetimes. The estimated net economic savings totaled $540 billion in direct costs and $2.7 trillion in societal costs. Notably, the measles vaccine had the single greatest impact, preventing roughly 13.2 million hospitalizations.[16]

From 1994-2023, routine childhood vaccinations prevented:

- **508 million illnesses**
- **32 million hospitalizations**
- **1.1 million deaths**

A 2026 paper showed the economic burden of measles in 2025 and modeled impacts of a continued decline in children receiving the MMR vaccine, including productivity losses from missed school and work, with the caveat that comprehensive assessments of societal costs are needed.[17] In 2025, productivity losses due to measles were $84.4 million. The modeling showed that productivity losses, along with outbreak response, drove costs due to measles.

In addition to economic impacts to manufacturing and the broader economy, there are also alternative direct costs due to absenteeism and attrition related to reduced vaccination rates of workers and their children. The federal government relies on payroll and income taxes, the former of which partly funds Social Security and Medicare. A study of a cohort of children born in 2017 found that **routine pediatric vaccination leads to approximately $41.7 billion in lifetime fiscal benefits, including averted tax revenue losses of $30.6 billion, disability savings of $1.6 billion and reduced special education costs of $910 million.**[18]

$42 Billion

in savings for the federal government due to routine pediatric vaccination

Preventative Health Care

Beyond these immediate workforce impacts, the economic burden of vaccine-preventable illness can extend further as employees who develop chronic or severe conditions can drive long-term increases in employer healthcare costs. Seventy percent of manufacturers cited healthcare and insurance costs as a primary business concern in the NAM's most recent Manufacturers' Outlook Survey.[19] Increased costs are disproportionately impacting small and midsize manufacturers, with 74% of small (fewer than 50 employees) and 78% of medium (50 to 499 employees) companies identifying healthcare costs as a top concern.

16 F. Zhou, T. C. Jatlaoui, A. J. Leidner, et al., "Health and Economic Benefits of Routine Childhood Immunizations in the Era of the Vaccines for Children Program—United States, 1994–2023," Morbidity and Mortality Weekly Report 73, no. 31 (Aug. 8, 2024): 682–685, http://dx.doi.org/10.15585/mmwr.mm7331a2.

17 Chad R. Wells, Abhishek Pandey, Yang Ye, et al., "The health and economic repercussions of declining MMR coverage in the United States," Proceedings of the National Academy of Sciences (2026), https://doi.org/10.64898/2026.02.19.26346619.

18 M. P. Connolly, N. Kotsopoulos, C. Roberts, et al., "Public economic gains from tax-financed investments in childhood immunization in the United States," PLOS Global Public Health 3, no. 10 (2023): e0002461, https://doi.org/10.1371/journal.pgph.0002461.

19 National Association of Manufacturers, Q2 2026 Manufacturers' Outlook Survey (June 10, 2026), https://nam.org/2026-second-quarter-manufacturers-outlook-survey/.

Preventative vaccination reduces healthcare spending by lowering the incidence of avoidable illness and hospitalization among working-age adults. A study from 2016 estimates that vaccine-preventable diseases imposed approximately $9 billion in economic costs in 2015, increasing to more than $12.5 billion in 2026 when adjusted for inflation.[20] Of these costs, more than three-fourths, or nearly $7.1 billion, were attributable to individuals who were not vaccinated, reflecting avoidable spending on physician visits, hospitalizations and lost income from preventable diseases. By reducing downstream medical costs, higher vaccination rates can help moderate employer-sponsored insurance expenses, limit unexpected healthcare claims, support a stable and productive manufacturing workforce and lower costs to the broader U.S. healthcare system.

Preventative vaccines also contribute to increased herd immunity. Herd immunity is community immunity that occurs when a high percentage of the population is immune to a disease due to prior vaccination or infection that therefore makes the spread of infection of that disease unlikely. In many cases, shop floor workers are in close proximity to one another, and a higher rate of vaccination among them will increase the likelihood of herd immunity without infection and illness leading to lost productivity from absenteeism, presenteeism and attrition.

Challenges and Recommendations

Vaccination remains one of the most effective tools for reducing the burden of infectious disease on the workforce and broader economy. Yet significant challenges continue in both advancing vaccine research and development and achieving widespread vaccine uptake. Uncertainty in federal vaccine policy threatens both public confidence and the conditions necessary for continued vaccine innovation. Without a stable and predictable policy framework, vaccine developers face difficult investment decisions, and manufacturers and their workers are left more vulnerable. Vaccination rates across the United States have declined in recent years, driven in part by this uncertain environment.

Addressing these challenges requires a policy agenda grounded in certainty and consistency that gives Americans the stable framework they need to make confident healthcare decisions, manufacturers the regulatory predictability required to invest in vaccine innovation and the workforce the protection it needs to remain healthy, productive and competitive on the global stage. This section examines the key barriers to effective vaccination and puts forward policy recommendations aimed at strengthening vaccination infrastructure, rebuilding public trust and improving vaccination rates across the population.

20 S. Ozawa, A. Portnoy, H. Getaneh, et al., “Modeling the economic burden of adult vaccine-preventable diseases in the United States, Health Affairs 35, no. 11 (2016): 2124–2132. NAM calculations adjust dollar values for inflation using the Consumer Price Index from the BLS, https://www.bls.gov/cpi/.

Supporting R&D and Innovation

America's manufacturers are at the forefront of the science and technology that underpin a healthy workforce and, by extension, a healthy economy. As vaccines face increased skepticism, it is important to consider the volume of R&D and robust clinical trials that are conducted before a vaccine is deemed safe and effective for the general population. The uncertainty created by changes to the Advisory Committee on Immunization Practices, potential changes to the Vaccine Injury Compensation Program and uncertainty and reduced staffing at the U.S. Food and Drug Administration and other public health agencies has produced an unpredictable vaccine environment that could lead to reduced vaccine development in the U.S. Simultaneously, the rise in vaccine hesitancy in the general population may also lead vaccine makers to scale back on development in the U.S., which will make manufacturing workers and their families less safe and healthy as new infectious diseases emerge.

To combat these challenges, manufacturers support policy decisions grounded in Gold Standard Science that support innovation and protect public health:

- Policymakers should safeguard the VICP to ensure that biopharmaceutical manufacturers have the certainty they need to develop, manufacture and distribute vaccines at the scale necessary for effective immunity.
- The FDA should set vaccine policy, including regulatory approvals, based on sound data and in alignment with Gold Standard Science that foregrounds the benefits of vaccines to the American people.
- The ACIP should ensure that its decisions with respect to the childhood vaccine schedule are based on Gold Standard Science, give parents the reliable information they need to protect their children's health and adhere to administrative process requirements.
- Policymakers should fully resource the FDA to ensure efficient reviews and approvals of new vaccines and biopharmaceutical manufacturing facilities. Similarly, policymakers should fully resource other public agencies critical to America's leadership in biopharmaceutical innovation.
- Policymakers should support and incentivize innovation at all stages of the R&D life cycle, including by funding foundational public health research, appropriately incentivizing early-stage tech transfer and investment, ensuring America's tax and regulatory policies support innovation, protecting innovators' intellectual property rights and ensuring that the FDA's approval processes are as innovative as the companies developing treatments and cures.

Increasing Vaccination Rates

Vaccine hesitancy, skepticism and misinformation have emerged as significant barriers to achieving and maintaining vaccination rates across the United States—with consequences that extend well beyond individual health outcomes.[21] These reduced vaccination rates translate directly into economic costs for America's manufacturers and the broader economy. Addressing the root causes of vaccine hesitancy is therefore not only a public health imperative, but an economic one. Vaccine hesitancy and confusion result from the following sources:

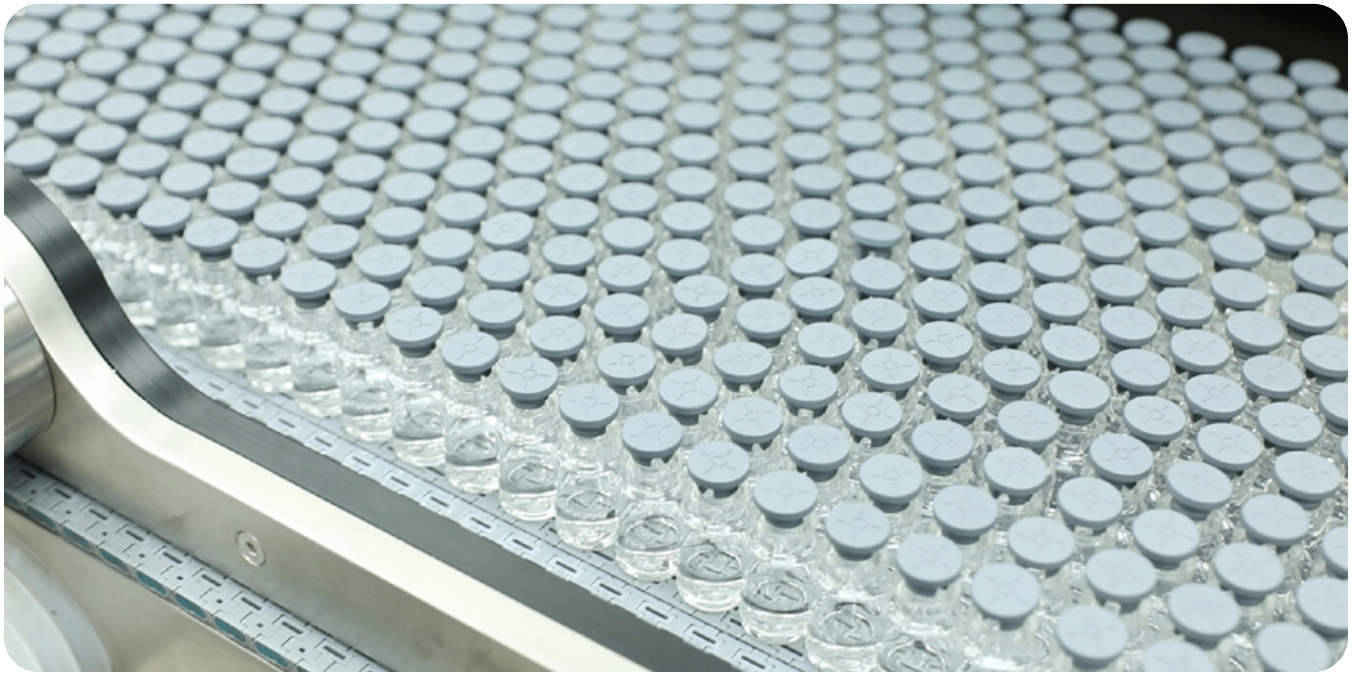
- Lack of trust in public health authorities (including as a result of historical treatment of minority and marginalized populations, controversies stemming from the COVID-19 response and mixed signals from government agencies)
- Changes in regulatory and government stances on vaccine recommendations, creating uncertainty about which vaccines are needed, which undermines public confidence
- Lack of trust in the pharmaceutical industry from people who have been exploited by other parts of the healthcare system, which fuels skepticism about vaccine safety and industry motivations
- Misinformation and unfounded skepticism, spread and amplified by social media
- Information overload and fatigue, as the growing number of vaccines available and the changes in vaccine recommendations make it difficult to keep up with what is recommended, when and for whom
- Accessibility barriers, including long wait times and a lack of providers and insurance coverage, which mean that some who are inclined to receive vaccines simply cannot get them
- Supply chain issues, with occasional shortages of specific vaccines resulting from material shortage, cold chain logistics, manufacturing delays and data gaps

21 Kaitlin Brumbaugh, Frances Gellert and Ali H. Mokdad, "Understanding vaccine hesitancy: Insights and improvement strategies drawn from a multi-study review," Vaccines 13, no. 10 (2025): 1003.

These barriers to vaccine uptake represent a real threat to the health of America's workforce. To combat such threats and ensure that the American people can make informed vaccine decisions based on Gold Standard Science, leaders should take steps to reduce vaccine hesitancy and ensure reliable supply of these lifesaving innovations:

- Leaders throughout the federal government should make clear that vaccines are safe and effective and can protect individual families and society at large from devastating illnesses. Leaders should commit to countering misinformation, disinformation and skepticism; they also should ensure that Gold Standard Science guides any vaccine policy decisions and that the relevant science is clearly communicated to the public.
- Policymakers should take steps to strengthen vaccine supply chains, including by ensuring vaccine manufacturers have access to needed inputs, investing in robust American infrastructure, supporting pro-growth tax and regulatory policies and providing the regulatory certainty necessary for long-term planning, investment and production by vaccine manufacturers.
- Policymakers should reduce access barriers to ensure that people who want vaccines can receive them and afford them, including by requiring that both public and private insurance cover vaccines to the greatest extent possible.
- Policymakers should take steps to help manufacturers offer affordable healthcare benefits to their employees at a time of rising healthcare costs, including by expanding Health Savings Accounts, increasing access to telehealth, encouraging adoption of Individual Coverage Health Reimbursement Arrangements and improving data transparency and accessibility.

Both to protect individual families and to ensure that vaccine rates reach the level necessary for societal herd immunity, the vast majority of Americans need to understand why prevention measures are important. Robust vaccine uptake benefits American families, manufacturers across the country and the federal government itself, in the form of increased tax revenue and reduced healthcare spending. Overall, ensuring a strong policy environment for vaccine innovation and ensuring that the scientific and public health benefits of vaccines are communicated to the American people will be critical for the U.S. to maintain its position as a manufacturing powerhouse.



The evidence is clear: workers, their families and the manufacturing economy writ large are harmed by vaccine skepticism and by policies that limit vaccine innovation and production. Conversely, manufacturers benefit—as do their workers—when strong public health policies result in more workers filling more shifts at more factories across the country.

The financial burden of vaccine-preventable illness on manufacturers, workers and supply chains calls for sensible public policy. Policymakers must remain cognizant of the economic benefits of vaccines and thus must ground vaccine decisions in Gold Standard Science—with an awareness of the broader consequences of reduced vaccine innovation and uptake for manufacturers, manufacturing workers and American competitiveness. This means both ensuring regulatory certainty so that manufacturers can invest in vaccine R&D and rebuilding public trust through transparency, consistency and engagement with the American people.

A vaccinated workforce is a productive workforce and the foundation for a strong American economy. When workers are healthy, production lines run, supply chains operate efficiently and the economy grows. Manufacturers are committed to keeping workers safe and healthy and to growing capacity in order to drive the American economy—and they depend on strong, science-based vaccine policy and public health communications from the federal government to empower the industry to invest, innovate and grow.

STAY CONNECTED

nam.org