

community health workers, payers, and policymakers will need to continue to address these issues through better communication with patients and families and increased care coordination and by providing care in the most appropriate setting.

The terms of Maryland's agreement with CMS require the state to transition to a model that will reduce costs and improve quality over the full spectrum of care — not just hospital services — by 2019. In 2014, the state's total per capita costs of care decreased by 0.64%, almost entirely as a result of reductions in hospital expenditures. CMS has launched a number of programs that can guide efforts to promote delivery-system transformation, such as bundled-payment initiatives and patient-centered medical homes. Because of the unique nature of the all-payer rate-setting system, however, CMS has empowered Maryland to develop its own payment models. This opportunity to test all-payer reform over the full spectrum of care will not only benefit Maryland but also provide important insights for other states seeking to further accelerate delivery-system reform.

CMS is committed to working

with Maryland to design and launch new all-payer payment models that connect all health care providers, hospital and non-hospital, through value-based care models that are appropriate for the state's rate-setting system. Maryland can also integrate local delivery-system reform efforts with public health activities and regional collaboration efforts to build the infrastructure to support these new approaches. The global budget program promises to catalyze such integration. Through their fixed and guaranteed budgets, hospitals can offer providers incentives such as per-member per-month payments, shared savings, or capital funding for investments in care redesign.

CMS has previously described engaging multiple payers in payment models as a foundational principle in achieving delivery-system reform.<sup>5</sup> Maryland is moving closer to that goal. As its all-payer model evolves, it will be important for hospitals, physicians, payers, consumer groups, and policymakers to combine their efforts to reflect a unified vision.

Both the state of Maryland and its hospitals deserve credit for

these promising early results. CMS remains committed to working with Maryland and the provider community to ensure the continued success of this model. We see innovation in hospital payment as an important part of CMS's growing efforts to reform delivery systems.

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## Docs and Nukes — Still a Live Issue

Ira Helfand, M.D., and Victor W. Sidel, M.D.

Seventy years ago, the medical profession alerted the world to the devastating effects of nuclear weapons. Just weeks after the bombing of Hiroshima, Dr. Marcel Junod, a representative of the International

Committee of the Red Cross

in Japan, visited the devastated city and sent back one of the first eyewitness reports to reach the outside world: "The center of the city was a sort of white patch, flattened and smooth like the palm of a hand. Nothing remained."

Ever since that time, members of the medical profession have played a key role in warning governments and the public about the danger of nuclear war and the urgent need to abolish nuclear weapons. During the period of intense international tension that

preceded the Cuban Missile Crisis, the *Journal* devoted the issue of May 31, 1962, to articles prepared by members of the newly formed Physicians for Social Responsibility (PSR), detailing the medical consequences of nuclear war.

During the period of increased Cold War tension in the early 1980s, the medical community mobilized again to educate the public about the enormous threat to public health posed by the arms race. Working with PSR, medical schools throughout the country organized public symposia to explain what would actu-

physicians have had in preventing nuclear war, the IPPNW was awarded the 1985 Nobel Peace Prize.

In the years since the end of the Cold War, the medical community has paid far less attention to this issue. We, like most of the world, have acted as though the danger of nuclear war were a thing of the past. To the extent that we have considered the matter, we have focused on the possibility that terrorists or “rogue states” such as North Korea and Iran will acquire nuclear weapons. Although these are important threats, it is critical that we under-

health system, the communications network, the electric grid, the banking system, the food distribution system — all would be gone. In the months after such an attack, the vast majority of Americans not killed in the initial attack would die from starvation, radiation sickness, epidemic disease, or exposure to the elements. A corresponding U.S. attack would create the same devastation in Russia, and if NATO were drawn into the war, much of Europe would suffer the same fate.

As incomprehensible as these direct effects are, they are only a part of the picture. The fires created by the use of nuclear weapons over urban targets would loft enormous quantities of black soot into the atmosphere, disrupting climate worldwide. A war involving the strategic weapons deployed today by the United States and Russia would generate some 150 million tons of soot, enough to reduce temperatures around the world by an average of 8°C. In the interior regions of North America and Eurasia, temperatures would drop by as much as 30°C, to levels not seen in 18,000 years, since the coldest point of the last ice age.<sup>3</sup> Food production would collapse, the vast majority of the human race would starve, and it's possible that our species would become extinct.

For 25 years, since the end of the Cold War, we have been told that we did not need to worry about war between the United States and Russia. The deepening crisis in Ukraine and President Vladimir Putin's repeated nuclear threats give the lie to these assurances: armed conflict between the nuclear superpowers remains a real possibility. Even if neither side ever uses its nuclear weapons

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ally happen if nuclear weapons were used. A newly formed global federation called the International Physicians for the Prevention of Nuclear War (IPPNW), of which PSR became the U.S. affiliate, carried out similar educational work around the world. Doctors met with Presidents Ronald Reagan and Mikhail Gorbachev to urge them to end the arms race that had brought the world to the brink of nuclear annihilation.

These efforts had a profound impact. In his memoirs, Gorbachev described the effect his meetings with physicians had on his thinking about nuclear weapons when he was launching the series of initiatives, ultimately embraced by the United States, that led to the end of the arms race. For this work, and in recognition of the special role and responsibility that

stand that the greatest danger is posed by the arsenals of the countries that already have nuclear weapons. There remain in the world today more than 15,000 nuclear warheads, 95% of which are in the arsenals of the United States and Russia.<sup>1</sup> Of these warheads, some 2000 are on hair-trigger alert. They can be fired in less than 15 minutes and can destroy their targets across the globe 30 minutes later.

These weapons pose an existential threat to humanity. A 2002 study showed that if just 300 Russian warheads got through to targets in the United States, 75 million to 100 million people would die from the blast and heat effects in the first half hour.<sup>2</sup> In addition, the entire economic infrastructure on which we depend would be destroyed. The public

deliberately, there remains the very real danger of accidental nuclear war. We know of at least five times since 1979 when either Moscow or Washington prepared to launch nuclear weapons in the mistaken belief that it was already under attack by the other side. U.S. military leaders now warn that cyberterrorists might be able to launch a U.S. or Russian nuclear missile.

Even a much more limited, regional nuclear war, as might take place between India and Pakistan, would have catastrophic consequences worldwide. Studies have shown that a war involving only 100 Hiroshima-sized weapons, less than 0.3% of the world's nuclear arsenals, would cause temperatures to fall an average of 1.25°C around the world.<sup>4</sup> Climate disruption of this magnitude would cause major declines in world agricultural output. At this time, there are some 800 million people who are malnourished and 300 million who get adequate nutrition but live in countries that depend on food imports that would not be available in the event of such a war. There are also about 1 billion people in China, which would see particularly severe effects on food production, who have not

shared in China's recent economic growth. All these people, some 2 billion, would be at risk in the "nuclear famine" that would follow even a limited nuclear war.<sup>5</sup>

In recognition of this grave threat to human survival, governments around the world have come together over the past 3 years in a series of extraordinary conferences to discuss the medical consequences, what they have called the humanitarian impact, of nuclear war. A total of 116 countries have signed the Humanitarian Pledge to seek a new treaty to fill a key gap in international law, which does not yet prohibit the possession of these weapons, and to push for their abolition.

We believe the medical community has a responsibility to support this movement. The American Medical Association recently passed a resolution calling on all nations to "ban and eliminate nuclear weapons," and the World Medical Association is considering a similar resolution at its Moscow meeting in October. Physicians need to act on these resolutions, sounding the alarm for a world that has grown dangerously complacent about the nuclear peril as we drift closer to an unimaginable catastrophe. We need to again educate our patients, the

general public, and our political leaders about the medical consequences of nuclear war and the urgent need to abolish these weapons before they are used.

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