seems out of balance when other more important aspects of controlling violence, such as gun control, are apparently given much lower priority.

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Response

WE AGREE WITH KLOPFER THAT THE WORK of Joy *et al.* (*1*) provides compelling evidence in support of the hypothesis that television viewing contributes to increased risk for aggressive behavior. It is important to note, however, that there is considerable evidence indicating that both the amount and content of television programming have important influences on behavioral and health outcomes (*2*–*6*).

We concur with Bakshi's observation that extensive viewing of media violence throughout childhood and adolescence may contribute to the development of an aggressive disposition, conduct disorder, and some types of personality disorder symptoms, particularly among youths who have a history of childhood maltreatment, maladaptive parenting, or other childhood adversities, and agree that it will be important for researchers to develop a multifactorial model that can explain how media violence interacts with other risk factors to contribute to aggressive behavior.

We find Hockey's letter to be problematic in several respects. Although our findings do not prove conclusively that extensive television viewing causes some youths to engage in acts of physical aggression, they are consistent with the findings of many other studies supporting such a causal inference (*2*, *3*). Hockey's suggestion that our findings can be explained by a tendency of aggressive youths to spend more time watching violent television programs may be incorrect because, in our study, television-viewing time was associated with increased risk for serious acts of aggression even among youths without a prior history of aggressive behavior. Considerable evidence from other studies indicates that there is a bidirectional association between media violence and aggressive behavior (*3*). Our review of the literature suggests that there may tend to be a vicious spiral among at-risk youths, in which media violence contributes to the development of aggressive attitudes and feelings, which promote further viewing of media violence, increasing the likelihood of aggressive behavior.

With regard to the role of genetic factors, twin studies support the conclusion that aggressive behavior is caused by environmental as well as genetic factors (*7*, *8*). The findings of our study and numerous other studies have indicated that media violence may be one of these environmental factors that contribute to the development of aggressive behavior.

Hockey correctly points out that our study did not assess the content of television programming that was viewed. This prevented us from examining which types of television programming are most strongly associated with risk for aggressive behavior. Previous research has provided considerable support for the inference that televised violence accounts for much of the association between television viewing and aggressive behavior. Because well over half of the programs on television depict violent acts, there is a strong association between overall television-viewing time and the amount of televised violence that is viewed (*2*). However, even extensive viewing of television programs containing little violence may indirectly contribute to increased risk for aggressive behavior. Youths who spend a great deal of time watching television are less likely to spend time engaging in interpersonal activities that promote social interaction skills. Such youths with relatively poor social skills may tend to have difficulty resolving interpersonal conflicts in a nonaggressive manner.

We believe that Hockey is mistaken in disputing Anderson and Bushman's observation (*2*) that there is a general consensus among most experts on the association between media violence and aggressive behavior. As they correctly pointed out, the American Medical Association and five other major health organizations have expressed the consensus opinion that "the data point overwhelmingly to a causal connection between media violence and aggressive behavior in some children" (*9*). Although a small number of studies have failed to support a causal inference and some scholars have been skeptical about the evidence supporting such an inference, it has become increasingly difficult to justify such skepticism in the face of a much larger and growing body of evidence indicating that media violence does tend to promote aggressive behavior.

Physical aggression, including bullying during childhood and adolescence, physical child abuse, domestic violence, brawling, street fighting, and violent crime, is a major public health problem in the United States and throughout the world. To reduce the frequency and severity of aggressive behavior, it is likely that many different kinds of intervention strategies will need to be implemented. One of the most effective ways to promote reductions in aggressive behavior may be to increase public awareness of the risk factors that contribute to interpersonal aggression. Reductions in television viewing are likely to contribute to significant reductions in aggressive behavior and violent crime (*10*, *11*).

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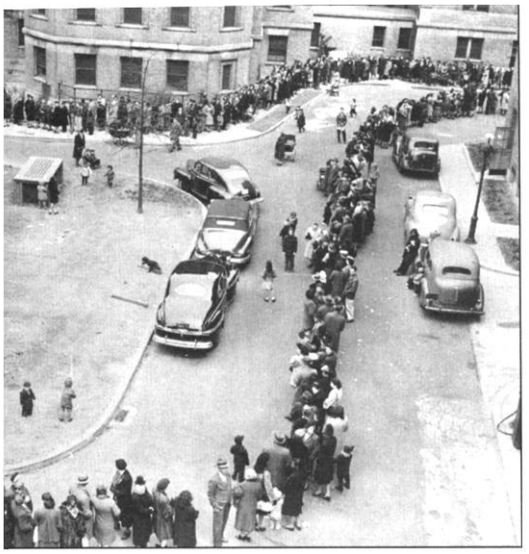
Smallpox Transmission Risks: How Bad?

MARTIN ENSERINK'S ARTICLE "HOW devastating would a smallpox attack really be?" (News Focus, 31 May, p. 1592) asserts that smallpox transmission primarily occurs after several hours spent in close contact with the index patient (i.e., the first infected patient in an outbreak). Although this may be the case, the recent report of a Soviet smallpox outbreak in 1971, in which a crew member of an offshore ship became infected after inhaling smallpox viral particles downwind from a military test site, illustrates that airborne transmission of the disease can occur over substantial distances (*1*).

The 1947 New York City smallpox outbreak occurred when an index patient infected others who were in the hospital at the same time. Indeed, one adult male patient became infected with smallpox while he was seven floors above the index patient (*2*). Another victim, a baby who had never been vaccinated, developed smallpox after he had been on the same hospital ward as the index patient. Nei-



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New Yorkers wait in line for a vaccine during the 1947 smallpox outbreak.

ther case had prolonged, direct contact with the index patient. The outbreak was contained after the city underwent a massive vaccination campaign in which over six million people were vaccinated in less than a month (*2*).

Policy-makers who conclude that smallpox is difficult to transmit are making a dangerous assumption. Although rare, there are examples of airborne transmission of smallpox. The most concerning situation would be the spread of the disease to an unvaccinated, susceptible population from a deliberately dispersed plume of viral particles. Any future smallpox outbreak would most likely be the result of a terrorist attack, not a naturally occurring event. Therefore, planning for a worst-case scenario such as the one envisioned in "Dark Winter" makes the most sense.

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Calling It Something Other Than Cloning

B. VOGELSTEIN AND COAUTHORS ("PLEASE don't call it cloning!," Policy Forum, 15 Feb., p. 1237) suggest that the term "nuclear transplantation" should be used for "somatic cell nuclear transfer to create stem cells." The use of the term in this context was preempted some 45 years ago to mean a process that leads to cloning—precisely what Vogelstein *et al.* are trying to avoid! The studies by King and Briggs (*1*) and Gurdon (*2*) on amphibia are described as nuclear transplantation and remain the classic examples that have been included in numerous textbooks ranging from the second edition of Srb *et al.* (*3*) through Suzuki *et al.* (*4*) to Campbell and Reece (*5*). Although most of these texts concentrate on the totipotency of the nuclei transferred, some emphasize [e.g., (*4*)] that it is the production of series of clones of the original individuals that shows the ultimate success of the nuclear transplantation process. Thus, generations of biology students will immediately think of cloning regardless of the context in which "nuclear transplantation" is used.

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VOGELSTEIN *ET AL.* SUBSCRIBE TO THE WIDELY held belief that a human being at an early developmental stage does not qualify as human.