My initial reaction to the Potts et al. hypothesis that the "pill is mightier than the sword" was disbelief. Do the authors really mean to imply that recent terrorist tragedies could have been prevented if women in those countries were able to practice effective fertility control? What about the ease of access to modern weapons or the influence of media in inspiring youth to join terrorist movements and kill others or the well-publicized violations of human rights due to policies of countries such as the United States and Israel?

To examine the hypothesis that the pill is mightier than the sword, I found indicators of both terrorism and the youth bulge. Demographers have often stated that a youth bulge provides evidence for a lack of access to family planning services and a high fertility rate. I also looked at research that investigated significant correlates of both terrorism and a youth bulge. According to the 2014 Global Terrorism Index (GTI) scores, countries with the highest 10 scores accounted for 90% of global terrorist attacks. The top 10 terrorist countries in 2014 with their terrorist score in parentheses were Iraq (10), Afghanistan (9.39), Pakistan (9.37), Nigeria (8.58), Syria (8.12), India (7.7), Somalia (7.41), Yemen (7.31), the Philippines (7.29), and Thailand (7.19). Terrorist scores were computed for 162 countries and values ranged from 0 to 10. The 4 weighted components of the GTI were number of yearly terrorists incidents, number of fatalities caused by terrorist incidents, number of injuries, and approximation of property damage.

Countries with a median age substantially lower than the global median age are classified as those with a youth bulge. The World Factbook reports that the global median age is 29.7 and also gives the 2014 median age of countries of the world. Research provides some support for the view that younger populations tend to engage in more violence than older populations. This statement is, of course, consistent with the "pill-sword" hypothesis. Also supporting this hypothesis is that nine of the ten 2014 highest terrorist countries have a median age less than the global median age, with Somalia having the lowest (17.7) and the Philippines the highest (23.5). Buddhist Thailand stands out among the other 10 countries in being classified as a high terrorist country with a median age of 36.2 and thus no youth bulge.

Part of my argument in questioning the "pill-sword" hypothesis is its simplicity. I have always rejected ideas that emphasize only one factor as a major cause of any major societal phenomenon. Countries with the highest rates of terrorism have many common characteristics that likely also contribute to these high rates. Some of these characteristics also inhibit the ability of women to control their fertility. For example, the high terrorist countries all had high gender inequality indices according to the 2014 Human Development Report that ranked countries from 1 to 152. For this index, both the Philippines (78) and Thailand (70) had lower gender inequality indices than the other high terrorist countries (range of 120 to 152); no index number was given for the Somalia or Nigeria. In patriarchal countries, women have low autonomy and would likely not have the skills or power to exercise their right to control their fertility. Abadian examined the relationship between female autonomy (measured by female age of first marriage, age difference between husband and wife and female education) and fertility rate for 54 less developed countries. Lower age of female marriage, greater age difference between husband and wife and lower female education were all highly and significantly correlated with higher fertility rates.

High terrorist countries also have many characteristics of a fragile state such as group grievance, poor public services, violations of human rights and ineffective security. The 2015 Fragile State Index is composed of 12 indicators that in turn are made up of more than 80 measures. One indicator, demographic pressures, is made up of 10 measures that include a youth bulge and population growth. My question for Potts et al. is why they singled out the youth bulge when other societal conditions might be more important in facilitating...
terrorism. Further, there are many countries that have a youth bulge, more characteristics of failed states, and low gender equality but have little terrorist violence. So, what are the societal factors and mechanisms that promote terrorism? The top 10 terrorist states that are predominantly Muslim or with a substantial Muslim population were also among the top 14 of the worst fragile states of the 178 states ranked. The fragile state ranking of the high terrorist non-Muslim countries, the Philippines, India, and Thailand, were 48, 68, and 71, respectively. Iman emphasizes that basic tenets of the Muslim religious right focus on women and the need to restrict their roles to that of wife and mother and to support customs that lower their autonomy. Iman also states that Muslim religious rights groups frequently work to limit family planning methods. If those in power promote such views of women, it seems unlikely that they would have the autonomy necessary to control their fertility. However, in addition, Iman acknowledges that some Muslim countries like Iran have supported contraceptive use, and there is little in Muslim law that supports strong restrictions on birth control.

I do not mean to single out Islam as the only religion that disempowers women. Iman stresses that most religious right movements of all religions share a number of characteristics that limit the rights of women. Indeed, in the United States, the Christian religious right has worked and continues to work to make birth control and family planning services difficult or impossible to access. Those in power in many countries today and historically often use religion as a way to maintain their control over laws and customs.

To add to the discussion of religion, consider the case of Thailand, the country with the 10th highest terrorist index. Potts et al. highlight Thailand as having a low fertility rate and access to family planning for decades. I believe this access was promoted by its support from the dominant religion, Buddhism. So the question is: If there is family planning in this high terrorist country, what other factors need consideration as causes? We cannot attribute the terrorism of Thailand to a “youth bulge.”

I do not agree with Potts et al. that improving family planning and the education of girls education are the “most amenable to change from a human rights perspective” or that “influential economists and development strategists” have been unaware that “family size falls when women have the knowledge and means to separate sexual intercourse from childbearing.” These views seem to imply that improving family planning and girls’ education are easy to bring about and that policy-makers have not understood the family planning needs of women. However, improving access to basic healthcare including family planning and the education of girls have been priorities of the World Health Organization (WHO), the United Nations Population Fund (UNFPA), the International Planned Parenthood Federation (IPPF), the World Association of Sexual Health (WAS) as well as human rights advocates, health professionals, and feminists for decades. A 2014 publication, for example, emphasizes that 225 million women in developing countries want to avoid pregnancy but lack modern contraceptives. So, this need is widely acknowledged and has been for some time, especially since the two watershed conferences, the 1994 International Conference on Population and Development and the 1995 Fourth World Conference on Women. At these conferences, both Christian and Muslim delegates lobbied hard to limit the sexual and reproductive rights of women, and this opposition continues to be a major barrier in much of the world. In addition to religion, the task of improving family planning and the education of girls faces other substantial barriers.

One common theme that relates to the control by women of their fertility links this control to their power in the institutions of society. Where women are valued and have respected roles in the political, economic, religious, familial, and education institutions their sexual and reproductive rights will be greater than where such roles are minimal. Others have stated this in somewhat different terms: Women have more reproductive and sexual freedom in societies where mothers receive help in the care of their children, where women have important economic and political roles, where the military has a minor role, and where women play an important part of the societal mythology and religion. All the aforementioned factors need to be addressed for the autonomy and empowerment of women to increase and thereby facilitate their fertility control. I do agree with Potts et al. that in states where women are educated, empowered, and have access to family planning and other healthcare, conditions supporting terrorist acts would likely be less.

As stated above, all the high terrorist countries also are characterized by low empowerment of women. The strongest arguments against Potts et al. come from a publication of the Institute for Economics and Peace (IEP). Contributors to this work examined many variables for the strength of their relationship to the GTI. They found the 3 most significant correlates of terrorist events to be political instability, lack of intergroup cohesion, and weak legitimacy of the state. Other significant correlates were safety and security, militarization, ongoing conflict, external and internal peace, level of organized and violent crime, and likelihood of violent demonstrations. To the surprise of researchers, there were no significant correlations of poverty, life expectancy, years of schooling or gross domestic product to terrorist events. Their explanation for these weak relationships was that there were so many low terrorist countries that also scored poorly on these measures of human development. The main drivers of terrorism were political or nationalistic and independence movements, and in the some parts of the Middle East, South Asia and sub-Saharan African religious ideologies were cited as a motivation for terrorism.

It is noteworthy that youth bulge was not mentioned as one of the variables in the IEP publication on global terrorism. However, I would predict that like the other characteristics of terrorist states such as gender inequality, poor access to health policy care, high government corruption, poor economic development, and poverty, there are so many low terrorist countries that also have these characteristics, that having a youth bulge would also not be significantly correlated with terrorist activities.

One of the most significant correlates of terrorism cited above was intergroup cohesion, and this refers to the relations of cooperation and respect between members of various identity groups within a society. This suggests that people in terrorist states have little tolerance and support for human rights of those who are not in their own identity group. In
this regard the work of Inglehart and Welzel\textsuperscript{15} may apply. These sociologists analyzed data from the European and World Values Surveys over decades. In their theory, positive development is a process characterized by economic growth, rising levels of education and information, and diversification of human interactions. They further state that when groups in a society have their basic economic and health needs met, then progress can be made in support of tolerance of different groups and their human rights. In their theory, it is difficult for people to support those outside their own group when they need to focus on their own difficult survival or concern about threats from other groups.

My own bias is that policy-makers should acknowledge the need for greater human rights education and application of human rights approaches to interventions. One important principle of human rights approaches is meaningful participation by all people affected by a given program. Other elements of rights-based programs are that they should be empowering; processes and outcomes need evaluation; programs should focus on marginalized and disadvantaged groups; measurable goals and indicators need to be identified; and accountability of all participants and administrators need to be examined.\textsuperscript{16} The task for peace-makers and aid organizations is to acknowledge the many factors that lead to terrorism and to understand social contexts when planning interventions. For health policy-makers, becoming knowledgeable about the burgeoning global support for health and human rights programs\textsuperscript{17,19} shows promise.

**Ethical issues**

Not applicable.

**Competing interests**

Author declares that she has no competing interests.

**Author’s contribution**

ILL is the single author of the manuscript.

**References**


