

Review article

Mortality of induced abortion, other outpatient surgical procedures and common activities in the United States[☆]Elizabeth G. Raymond^{a,*}, Daniel Grossman^{b,c}, Mark A. Weaver^d,
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Abstract

Objective: The recent surge of new legislation regulating induced abortion in the United States is ostensibly motivated by the desire to protect women's health. To provide context for interpreting the risk of abortion, we compared abortion-related mortality to mortality associated with other outpatient surgical procedures and selected nonmedical activities.

Methods: We calculated the abortion-related mortality rate during 2000–2009 using national data. We searched PubMed and other sources for contemporaneous data on mortality associated with other outpatient procedures commonly performed on healthy young women, marathon running, bicycling and driving.

Results: The abortion-related mortality rate in 2000–2009 in the United States was 0.7 per 100,000 abortions. Studies in approximately the same years found mortality rates of 0.8–1.7 deaths per 100,000 plastic surgery procedures, 0–1.7 deaths per 100,000 dental procedures, 0.6–1.2 deaths per 100,000 marathons run and at least 4 deaths among 100,000 cyclists in a large annual bicycling event. The traffic fatality rate per 758 vehicle miles traveled by passenger cars in the United States in 2007–2011 was about equal to the abortion-related mortality rate.

Conclusions: The safety of induced abortion as practiced in the United States for the past decade met or exceeded expectations for outpatient surgical procedures and compared favorably to that of two common nonmedical voluntary activities. The new legislation restricting abortion is unnecessary; indeed, by reducing the geographic distribution of abortion providers and requiring women to travel farther for the procedure, these laws are potentially detrimental to women's health.

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In the past few years, state legislatures across the United States have enacted an unprecedented slate of laws that regulate the provision of induced abortion, ostensibly to protect the health of women undergoing the procedure [1,2]. These laws impose explicit requirements both for clinicians

who perform abortion and for the facilities where they work. For example, several states recently mandated that abortion providers have admitting privileges at a local hospital (see, e.g., ALA. CODE § 26-23E-4(c); MISS. CODE ANN. § 41-75-1(f); TEX. HEALTH & SAFETY CODE ANN. § 171.0031; WIS. STAT. § 253.095). Others required that facilities providing abortion services meet particular structural standards beyond those generally required for office-based surgical practice (see, e.g., MICH. COMP. LAWS § 333.20115(2); MO. REV. STAT. § 197.200(1); TEX. HEALTH & SAFETY CODE ANN. § 245.010(a); VA. CODE ANN. § 32.1-127(B)(1)).

In considering whether such laws targeting abortion are warranted, understanding the risk of abortion relative to other regularly accepted risks is useful. In this review, we

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compare abortion-related mortality in the United States to mortality associated with several other surgical procedures performed outside a hospital and with mortality related to nonmedical activities that reproductive-aged women may engage in.

1. Methods

We calculated the abortion-related mortality rate during the decade 2000–2009 by dividing the number of deaths related to legal abortion in the 50 states and Washington, DC, during those years by the number of legal abortions occurring in the same time period. We obtained the former figure from the Centers for Disease Control and Prevention, which performs active surveillance of multiple sources, including state vital records, public health agencies, maternal mortality review committees, health-care providers, provider organizations, private citizens and citizen groups and media reports [3]. The number of abortions was obtained from a report published by researchers at the Guttmacher Institute, which conducts periodic surveys of all known abortion providers in the United States [4]. Both sources included data from all abortions performed at any gestational age and in either outpatient or hospital settings.

We searched PubMed to find English-language studies on the risk of death associated with surgical procedures performed outside of a hospital setting on generally healthy reproductive-aged women, specifically plastic surgical procedures, dental procedures, interval female sterilization, and hysteroscopy. Our search strategy, which we last implemented on June 14, 2014, was the following: ("Ambulatory Surgical Procedures/mortality"[Mesh] OR ("Sterilization, Reproductive"[Mesh] AND "postoperative complications/mortality"[MESH]) OR Anesthesia, Dental/mortality[MESH] OR "Hysteroscopy/mortality"[Mesh] OR ("Surgery, Plastic/mortality"[Mesh] AND "Ambulatory Surgical Procedures"[Mesh]) OR ("post-operative complications/mortality"[MESH] AND (ambulatory or outpatient)) OR ("outpatient surgery"[OT] AND sequelae [OT])) AND English[LA]. We reviewed reference lists of selected articles identified to find additional sources. To maximize current generalizability, we limited our analysis to studies conducted in the United States within the past 15 years (since 1999) that were either analyses of data collected by health authorities or organizations or prospective multicenter studies of standard practice. We also excluded studies in which the patient population was reported or assumed to be entirely or largely outside the reproductive age range and results of studies that in our judgment likely had incomplete data on deaths or patients.

We also searched PubMed on March 21, 2014 for studies of deaths occurring during or within 24 h after running a marathon in the United States since the year 2000 using the following search strategy: marathon AND (mortality OR death) AND English[LA]. We excluded data that were clearly subsets of the data reported in another included study.

We obtained data on fatalities occurring to participants in the Register's Annual Great Bicycle Ride Across Iowa (RAGBRAI), an annual 7-day event, from the RAGBRAI Website and newspaper articles. Initiated in 1973, RAGBRAI registers thousands of participants every year and claims to be the oldest, largest and longest bicycle touring event in the world (www.ragbrai.com, accessed 27 April 2014).

We used data from the National Highway Traffic Safety Administration to calculate deaths related to travel by passenger car in the United States.

2. Results

The mortality rate related to abortion at any time in pregnancy during the years 2000–2009 in the United States was 0.7 per 100,000 abortions (Table).

We found two qualifying studies that provide data on deaths associated with plastic surgical procedures performed outside of a hospital. The first included all operations performed at ambulatory surgical centers (ASCs) licensed by the state of Florida in the year 2000 [5]. The second included all plastic surgery cases at ASCs accredited by the American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF) between 2001 and 2012. The most common procedures in that study were breast augmentation and related procedures, liposuction, mastopexy and reduction, facelift and related procedures and abdominoplasty [6]. Both the Florida Agency for Health Care Administration and the AAAASF required that providers report all surgical procedures and related deaths during the time period. The mortality rates in both studies were as high or higher than the abortion-related mortality rate (Table). We found no studies of office-based surgical procedures (that is, procedures performed at facilities that were not accredited ASCs) that met our inclusion criteria.

We identified three studies of mortality associated with outpatient dental surgery (Table). The first collected prospective data about all patients who had dental procedures involving local anesthesia, conscious sedation, deep sedation or general anesthesia performed by a purposively selected set of 79 members of the American Association of Oral and Maxillofacial Surgeons across the United States in 2001 [7]. No deaths were reported. The second study was a survey of members of the Massachusetts Society of Oral and Maxillofacial Surgeons who were in active practice in 2004 [8]. All members responded. Four deaths were reported following procedures involving local, parenteral or inhaled anesthesia or sedation in 2000–2004. The researchers concluded that only one could definitively be considered an "in-office death," although none were clearly unrelated to the dental procedure. The total number of procedures involving anesthesia in 2004 was 347,076. Extrapolating this number to the previous 4 years, the researchers reported a mortality rate of 0.06 deaths per 100,000 procedures; the rate would be 0.2/100,000 if all four deaths were included

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