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Epidemiology of Genocide: An Example from the Former Yugoslavia

Ashley Maxwell and Ann H. Ross
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Abstract
There are multiple factors for the advent of war, and in the former Yugoslavia and Rwanda, nationalistic goals and political control were used to justify the genocide of thousands of individuals, mainly males of battle age, between sixteen to sixty years of age. War and genocide have detrimental effects on population health due to population displacement, food shortages, and the decline of health services. The skeletal remains of victims from Srebrenica, Bosnia, were analyzed for pathological conditions to assess general health and were compared with other countries that have experienced genocide to evaluate health issues in various parts of the world. Approximately 35% of the skeletal sample shows evidence of congenital and pathological conditions that may be population specific, which indicates that declining health was prevalent before the war, especially prenatal requirements for expectant mothers. In addition, data on general health from Rwandan and former Yugoslavian refugees showed a prevalence of acquired pathologies, mainly AIDS, while Bosnian and Herzegovinian refugees showed an increase in tuberculosis and heart diseases after the war. The skeletal and clinical research details the health problems that existed before and after the wars/genocide, and shed light on the current health problems that still need to be addressed. Marginalized and vulnerable groups, such as victims of genocide, need immediate action to prevent morbidity and mortality in the future. This study may be the first to outline the health status of victims of genocide and identify group marginalization as a path to genocide.

Keywords
Genocide, population health, pathology

The war in the former Yugoslavia was due to multiple factors including historical, economic, political, and ethnic differences. Unfortunately, these conflicts led to the massacre of innocent people and the expulsion of various ethnic and religious groups (Rohde 1997; Markusen and Mennecke 2004). The former Yugoslavia was composed of Serbians (Orthodox Christians), Bosnian Muslims, Croats (Roman Catholics), and other groups viewed as ethnically different when, in fact, they all originated from the same Eastern European Slavs (Rohde 1997; Ross 2004). In areas such as Bosnia, Kosovo, and Rwanda, the motivation for genocide varies from nationalistic ideologies to ethnic cleansing. The effects of genocide are still felt among survivors, including an overall health decline.

The wars in the Balkans resulted from a long history of empire occupations characterized by divisions between ethnic groups, which included divisions between countries of the former Yugoslavia (Rohde 1997). Nationalistic drives led Croatia and Slovenia to declare independence from Yugoslavia on June 25, 1991; this separation invoked violent fighting between Croats and Serbs (Rohde 1997). Croatian Serbs were opposed to the idea of independence from Serbia, thus a seven-month fight erupted, resulting in genocidal massacres. The fighting spilled over into Bosnia, which was divided among Muslims, Serbs, and Croats, leading “to the most brutal battlefield of the Balkan wars” (Jones 2011, p. 321). The genocide was largely due to nationalistic endeavors and political manipulations, which resulted in ethnic cleansing (forced removal of an ethnic group) and genocidal rape (Rohde 1997, Markusen and Mennecke 2004). The term “ethnic cleansing” was first coined by the perpetrator Slobodan Milosovic in Kosovo in 1987 to secure that the “Greater Serbia” would be ethnically pure (Blum et al. 2007). What occurred in Bosnia has been further described as “gendercide,” which was implemented by a central policy by Serbian forces to annihilate men of battle age between sixteen and sixty years of age. This was a Serbian strategy to not only guarantee military victory, but also to facilitate the removal of target populations and to establish post-genocide political territory and
boundaries (Jones 2011). What resulted were the displacement of 700,000 people and the massacre of approximately 200,000 civilians in Bosnia alone (Markusen and Mennecke 2004).

Srebrenica was a town of about 37,211 people until Bosnian Muslims were expelled in 1992 (Rhode 1997). It was after 1992, when the Bosnian Serb Army occupied Srebrenica, that the gendercide of the male population occurred (Brunborg, Lyngstad, and Urdal 2003). On July 6, 1995, the Bosnian Serb Army shelled Srebrenica, separated males from their families for execution, and ambushed those fleeing the area. The Srebrenica slaughter of 1995 has been confirmed as the most vicious act of gendercidal killing in Bosnia, and approximately 8,000 Muslim men and boys were specifically targeted (Brunborg, Lyngstad, and Urdal 2003; Jones 2011). About 1,900 bodies have been recovered from this area with only a few identified (Brunborg, Lyngstad, and Urdal 2003).

The genocide that took place in Rwanda resulted from similar political motivations of power and ethnic cleansing. As in the Balkans, Hutus and Tutsis could not be considered ethnically different as they share the same religion, language, and territory (Jones 2011). The Rwandan political leader Juvenal Habyarimana created the National Revolutionary Movement for Development party to gain complete control over the country, and thus he expelled any opposition, including the Tutsis, from the country and refused to let refugees back in (Spalding 2009). These groups of Tutsis formed their own military called the Rwandan Patriotic Front (RPF) (Spalding 2009). With the Rwandan economy under stress due in part to the plummeting coffee prices, Habyarimana feared that he would lose the country’s support, which led him to create an anti-Tutsi sentiment (Spalding 2009). In 1992, this led to the first horrific massacre when the RPF attacked Kibuye, Rwanda (Spalding 2009). Fictitious stories of the RPF led to ethnic rivalries with the Hutus and the killing of thousands of innocent people (Spalding 2009). The following year, Habyarimana was killed, inciting the murder of 5% to 10% of the Rwandan population over the span of a month (Hintjens 1999). One million people were murdered with machetes, clubs and small arms in only twelve weeks (Jones 2011). The genocide in Rwanda was strategically planned, leading to the almost complete extermination of the Tutsis (Hintjens 1999). One report details, “93.7% of the victims were killed because they were identified as Tutsi; 1% because they were related to, married to or friends of Tutsi; 0.8% because they looked like Tutsi; and 0.8% because they were opponents of the Hutu regime at the time or were hiding people from their killers (Jones 2011, page 360).”

The motivations for genocide in the former Yugoslavia and Rwanda resulted from nationalistic goals and political control that utilized ethnic differences as a raison d’être for genocide and ethnic cleansing. Understanding the physical health of the victims and refugees of populations affected by genocide can help aid in creating preventative measures. The health of populations affected by genocide before and after war can be somewhat understood by analyzing the remains of the victims along with the survivors. This study aims to 1) examine the demographics of the victims of genocide; 2) examine the skeletal pathologies evident within a sample of genocide victims from Srebrenica, Bosnia, where the frequencies of certain pathologies may provide insight into the health of this population; and 3) compare these to declines in health in other countries that have experienced genocide, such as Rwanda, to provide an additional risk factor for policymakers to utilize in their assessment for mobilization in genocide prevention.

Materials and Methods

A sample of 142 Bosnian male individuals of fighting age from the Srebrenica massacre was examined for pathological conditions. All of the data was collected by the second author. Age was estimated using common aging standards (e.g., pubic symphysis, sternal end of the right fourth rib, etc.). Using these standards the victims were found to fall between 16 and 60 years of age. However, caution must be exercised when using these age ranges as part of any analysis as American standards used at the time were found to not work well with the Bosnian population and generally over aged individuals. When the data was collected, the victims were stored at the Komemorativni Centar in Tuzla, Bosnia. Permission to conduct gross skeletal examinations and database storage was granted by Amor Maˇsovi´c, former president of the state commission for missing persons, Bosnia. The database was developed by the second author for the Bosnian Government to aid in the identification efforts.

Results

Approximately 35% of the sample shows evidence of congenital and pathological conditions that may be population specific. Table 1 presents the frequencies of types of pathologies observed in the sample.

Congenital/Hereditary Conditions

Manubriosternal and Sternoxiphoidal Fusion

There are twelve cases (8.4%) of sternoxiphoidal fusion (fused sternum and xiphoid process) and five cases (3.5%) of both manubriosternal (fused manubrium to the sternum) and sternoxiphoidal fusion (Yekeler et al. 2005).
Table 1. Pathology Frequencies

<table>
<thead>
<tr>
<th>Pathology</th>
<th>N = 142</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sternoxiphoidal Fusion</td>
<td>12</td>
<td>8.4</td>
</tr>
<tr>
<td>Manubriosternal and Sternoxiphoidal Fusion</td>
<td>5</td>
<td>3.5</td>
</tr>
<tr>
<td>Spina Bifida</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Spondylosis</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Divided Transverse Process</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Bifurcated Rib</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Double First Rib</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Supernumerary Teeth</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Sacralization</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Mastoiditis</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>Ankylosing Spondylitis</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Wormian Bones</td>
<td>5</td>
<td>3.5</td>
</tr>
<tr>
<td>Inca Bones</td>
<td>2</td>
<td>1.4</td>
</tr>
</tbody>
</table>

(Figures 1 and 2). Fusion of the sternum is a developmental variation seen in individuals as young as 20 years old (Yekeler et al. 2005). Interestingly enough, the youngest individual in the Bosnian sample is 16 to 19 years old and two other individuals are 17 to 20 years old. The remaining 14 individuals are between the ages of 30 and 55. Bifurcation of the xiphoid process (the branching of the xiphoid into two ends) and cartilaginous extension at the end of the sternum, which ossifies in adulthood, were also observed. This anomaly is considered a normal variant due to the incomplete development of the sternum (Yekeler et al. 2005).

Spina Bifida Occulta

Spina bifida, or the failure of the neural arch to fuse, leaving the overlying vertebrae open or unfused and the spinal cord was observed exposed in six individuals with a frequency of 4%. The exact etiology of spina bifida is unknown. One individual had evidence of both spina bifida and a double first rib.

Spina bifida occurs when there is a failure of the caudal neural tube to fuse, which is usually associated with a deficiency in folic acid during the prenatal period (Mitchel et al. 2004). In the United States, folate fortification of enriched grain products has been mandatory since 1998. As a result, there was a 19% reduction of neural tube...
defects birth prevalence after fortification (Honein et al. 2001). However, in recent years we may be seeing a rise in neural tube defects, which include hydrocephalus, an abnormal amount of fluid in the brain, rib anomalies, and club foot to name a few, due to the recent fad diet trends of low-carbohydrate diets (Bar-Oz et al. 2008).

Spondylolysis

Three individuals in the sample are congenitally missing the spinous process of the fifth lumbar vertebra (2%). This condition is referred to as spondylolysis, and it is characterized by the separation of the spinous process (neural arch) from the vertebral body (Figure 3). It can result from both a congenital defect and stress-related injury (Mann and Hunt 2005). Clinical studies have found that 3% to 10% of the adult population has this condition (Mann and Hunt 2005). This defect can be the result of a stress fracture in adolescent athletes who over-train in martial arts, gymnastics, and tennis to name a few (Standaert and Herring 2000). However, there is also a genetic component that tends to be more common in some populations. While this is more prevalent in children and usually arrests after age 40, all three of the individuals in the sample are over 50 years old, suggesting a congenital causation in this population (Mann and Hunt 2005).

Divided Transverse Process

Three individuals (2%) also exhibit a congenital anomaly called a divided transverse process of the first lumbar vertebra (Figure 4). This is a developmental variant that occurs during the growth stages of the spine where there is a caudal shift that causes the formation of the lumbar vertebrae to change (Mann and Hunt 2005).

Bifurcated Ribs

Two individuals in the sample have rib defects. One individual has a double first rib, while the second individual has a bifurcated rib (branching of the rib into two ends). Mann and Hunt (2005) consider these congenital defects to range from uncommon to common. Bifurcated ribs generally develop when there is a caudal shift of the cervicothoracic border during development (Mann and Hunt 2005).

Hyperodontia

Two individuals (1.4%) in the sample have additional teeth called hyperodontia or supernumerary teeth. This is a congenital condition that occurs during the development of the tooth bud and results in the localized hyperactivity of the dental lamina (Rajab and Hamdan 2002). Supernumerary teeth can occur singly, in multiples, unilaterally, or bilaterally. Also, the anterior maxilla is the most common place for this defect to occur (Rajab and Hamdan 2002). One individual has an extra right maxillary incisor, while
the other individual had an extra left lateral mandibular incisor (Figure 5).

The etiology of this anomaly is not fully understood, but there is supportive evidence for a hereditary factor caused by an autosomal dominant trait (Rajab and Hamdan 2002). In addition, there is predominance for this defect to occur more so in males than females (ratio 2.2:1), which may indicate a sex-linked trait. Other research indicates environmental factors play a role in its occurrence (Rajab and Hamdan 2002).

Current research suggests that this defect occurs in the teeth of Europeans from 0% to 3.8%, but it is more common in Asian populations with a prevalence of 3% and higher (Rajab and Hamdan 2002). Furthermore, permanent dentition appears to be the least affected with a 0.3%–0.8% occurrence (Rajab and Hamdan 2002). This trait was observed in the permanent dentition of this sample.

Sacralization

There is one case of sacralization of the fifth lumbar vertebrae or fifth lumbar fused with the sacrum. This is a congenital abnormality that is fairly common and occurs in 6% of individuals in clinical studies (Mann and Hunt 2005).

Acquired Pathologies

Mastoiditis

There is one definite case and seven (5%) probable cases of mastoiditis (middle ear infection) in the sample (Figure 6). Mastoiditis is caused by inflammation and infection of the middle ear (otitis media) (Mann and Hunt 2005). Severe cases can cause perforation and resorption of the mastoid process. This is also a precursor for ear disease and usually occurs in young children (Harley, Sdtalis, and Berkowitz 1994). It is considered uncommon and rare in most contemporary populations and rarely observed in contemporary skeletal samples. However, there seems to be a high incidence in the Bosnian sample, which is most likely the result of poor health care during the period of communist Yugoslavia. In developed countries, this condition is usually treated with intravenous antibiotics or myringotomies (drainage tubes) and in severe cases mastoidectomies or the removal of the infected air pockets of the mastoid bone may be necessary (Harley, Sdtalis, and Berkowitz 1994).

Ankylosing Spondylitis

One individual in the sample has a definite case of ankylosing spondylitis, while another shows symptoms of the pathology (Figure 7). Ankylosing spondylitis is a progressive inflammatory disease of unknown etiology...
that affects the joints of the spine, costovertebral joints, sacroiliac joints, hips and the shoulder, and is more prevalent in males than females with a ratio of 9:1 (Ortner 1991). The individual in the sample with symptoms of ankylosing spondylitis has bilaterally fused sacroiliac joints, which is caused by irregular erosion of the articular surfaces and subchondral bone, which provides support for cartilage on both sides of the joint (Ortner 1991). Current research suggests there is a combination of environmental, genetic, sex, age, and population-related factors that cause an onset of this pathology (Calin 2002). This condition is linked to a histocompatibility complex antigen and is inherited as a Mendelian dominant trait (Mann and Hunt 2005). There is a high incidence of anklosing spondylitis in European followed by African, Native American, and Asian populations (Mann and Hunt 2005).

Morphological Variants

Wormian Bones

Five individuals (3.5%) in the sample had evidence of wormian bones (Figure 8). These are sutural bones, supernumerary bones, and ossicles that occur from independent ossification centers on the suture lines (or joints) of the cranium (Mann and Hunt 2005; Loughlin 2003). The etiology of these accessory bones is still being debated. However, numerous studies suggest that cultural practices (cranial deformation along with positional plagiocephaly) contribute to the frequency and location of these bones (Loughlin 2003). For example, a study by Loughlin (2003) shows that lambdoid and occipital deformation showed higher frequencies of coronal ossicles. There are three individuals in this sample that had coronal wormian bones, and there appears to be some form of cranial modification present in the population, perhaps as a result of infant positional plagiocephaly (or flattened head syndrome due to preferential sleep practices). The crania have flattened occipital bones, suggesting that there was some form of pressure on the back of the head during development.

Another possible cause of wormian bones is a rare disease called osteogenesis imperfect (OI) or brittle bone disease. This pathology is caused by an inborn deficiency of the mesenchymal cells, which causes numerous skeletal changes (Ortner 1991). One of these changes occurs in the skull where at first ossification centers are poorly developed. However, if the individual survives to adulthood, multiple ossification centers develop, leading to wormian bones (Ortner 1991). A study by Cremin et al. (1982) compared radiographs of individuals with the disease (n = 81) and those without (n = 500) and found that each patient with OI had wormian bones and those without did not.

Inca Bones

There are two individuals (1.4%) in the sample that exhibit an Inca bone. The Inca bone occurs where the mendosa suture is retained and continues from asterion to asterion. Basically, the Inca bone forms due to a failure of fusion of the interparietal ossification centers (in the region of bone formation between the parietal bones of the cranium), and a triangular area forms in the lambda region (Hanihara and Ishida 2001). Hanihara and Ishida (2001) performed a study on various populations to see if there is a geographical pattern in the presence of the Inca bone. They found that it was the least abundant in Northeast Asia, Europe, and Australia (less than 1%) and more prevalent in the New World and Sub-Saharan Africa, with a frequency of 10% and above. While the etiology is still unknown, cultural practices (cranial deformation) are one possible explanation. As mentioned earlier, the Bosnian sample shows evidence of some form of cranial modification in the occipital area, which could account for the presence of both Inca and wormian bones.

Discussion and Conclusion

It has been estimated that 170 million people have been victims of genocide, massacres, and other atrocities in the 20th century (Blum et al. 2007). Blum and colleagues (2007) summarize the ravages of war in the 20th century.
and call attention to the fact that in all instances of genocide since 1948 the UN and international community have been slow to respond despite media coverage of events. One of the key factors for the inaction by the international community is the length of time it takes the UN council to classify an armed conflict as genocide. This was clearly observed during the most recent war in the Balkans where the international community sanitized the genocide by adopting the term “ethnic cleansing,” a term used by the génocidaires themselves despite evidence to the contrary. This was also observed in Darfur by the reluctance to assign the extrajudicial expulsions and deaths en masse as “genocide” to avoid significant involvement. According to the 1948 UN General Assembly, the term genocide carries implications for action by the international community and the United Nations, which has resulted in the avoidance, stalling, and hesitation to label an armed conflict as genocide to evade involvement.

War and genocide have detrimental effects on population health due to population displacement, food shortages, and the decline of health services (Toole and Waldman 1997). Several million people in the former Yugoslavia and about 2 million people in Rwanda have been displaced (Toole and Waldman 1997). Along with displacement, armed forces often disrupt crops and food deliveries, and herds are destroyed in order to facilitate the complete annihilation of the targeted group (Toole and Waldman 1997). The countries discussed in this paper already had poor health care before the armed conflict, making health care even more difficult for refugees, especially expectant mothers from genocidal rape (Toole and Waldman 1997). This is outlined in the pathological conditions present in the Bosnian sample and the diseases recorded for Rwandan refugees.

Gregory Stanton, president of Genocide Watch, presented to the U.S. State Department a briefing statement (1996) that outlined the following eight stages of genocide: 1) Classification—groups and cultures use a classification system to identify “us” and “them”; 2) symbolization—skin color, nose shape, cultural symbols, such as forcing the targeted group to wear an identification symbol (e.g., yellow star worn by Jews in Nazi Germany); 3) dehumanization, e.g., Rwandan hate propaganda referred to the Tutsis as cockroaches; 4) organization—requires the collective to act as a group in the killings; 5) polarization—groups invoke initial killings followed by revenge killings; 6) preparation—includes identification of victims (e.g., ID cards, marked houses, etc.); 7) extermination—victims are not considered humans (e.g., use of “ratonade” or rat extermination in Algeria); and, finally, 8) denial—following a genocide there is always denial, which surfaces as attempting to conceal the mass graves. Other examples of denial include satellite images showing the relocation of mass graves in Bosnia and the concealment of bodies with garbage and debris from a different time period by Serbian forces to misdirect the investigations (e.g., Bihac, Bosnia with WWII debris such as identification cards, etc.). A recent example of denial can be observed with the arrest in Serbia and subsequent transfer to The Hague for trial at the International Criminal Tribunal for the former Yugoslavia of Ratko Mladic, who was responsible for the Srebenica genocide. Alarmingly, many Serbian citizens continue to view him as a war hero posing a potential threat for future acts against humanity. In addition, several risk factors have been identified as enabling conditions for genocide: these include armed conflict, a past history of genocide (e.g., Croatia, former Yugoslavia), critical economic crisis with unequal income distribution, hate propaganda, discriminatory legislation, severe state repression, exclusionary ideology, high infant mortality, and leadership instability (Harff 2003; Jones 2011).

De Jong (2010) suggests that health and nutritional indicators are also important influencing factors in the commencement of armed conflict, and data show that malnutrition is 45% higher, child malnutrition is 50% higher, and child mortality rates are 102% higher than in non-conflict regions (Pinsstrup-Anderson and Shimokawa 2008). The various pathologies present in the sample from Srebrenica confirm that health care was inadequate even before the genocide. This was further supported by the presence of at least seven congenital conditions recorded for this sample. The World Health Organization (WHO 2010) reports that congenital anomalies affect 20% of newborns and children in Europe, and 13% in Bosnia and Herzegovina (WHO 2006). A poll taken in Africa indicates that one of the major causes of death in newborns and children are congenital anomalies with a frequency of 7%, with a death rate of 6% for Rwanda (WHO 2010, WHO 2006). The Spina Bifida Association of America (2009) estimates that more than 166,000 people are born with this condition (0.3%). The United Kingdom also projects that 10 to 15 people per 10,000 (0.1%) had this condition in the 1990s, a decline from previous years due to policies created to aid in folic acid supplementation (Patient UK 2009). In Africa, about 1 in 3 babies per 1,000 have spina bifida, and the Bosnian sample has a frequency of 4%, indicating that prenatal requirements were not being met for pregnant mothers (Miles 2006).

Data on Rwandan and the former Yugoslavian refugees contains information on acquired pathologies. One of the many health issues that increased in these areas post-conflict is the prevalence of HIV (Rwanda 15%–49%, Bosnia and Herzegovina 0.1%, Croatia 0.1%) due to at least 20,000 women being raped (Annex 1 country profiles 2006; Toole and Waldman 1997). Table 2 presents the major diseases that have affected the Rwandan refugees. Newborn deaths are the leading problem affecting refugee populations followed by diarrhea and malaria (Toole and Waldman 1997).
Bosnia and Herzegovina show an increase in tuberculosis after the war due to the ineffective treatment of people with active cases (Toole and Waldman 1997). The leading causes of death are related to heart diseases. Data for 2002 are provided in Table 3. The males in the present study also show skeletal evidence of acquired pathologies including chronic ear infections and arthritis.

The Genocide Prevention Task Force, co-chaired by Madeleine Albright and William Cohen, former secretaries of state and defense, respectively, submitted their report in 2008 entitled, “Preventing Genocide: A Blueprint for U.S. Policymakers.” In the report, it is stressed that prevention is the preferred course of action rather than later crisis management. They conclude that the prevention of genocide can be achieved through partnerships between national and international governments and NGOs.

Warnings, risk factors, and stages of genocide have been outlined in several multidisciplinary outlets. Genocide requires a multidisciplinary approach to crisis prevention and, when viewed pragmatically if not humanitarily, the ravages of genocide have drained the world emergency aid services and the economic burden is far greater once the eighth stage of genocide has been initiated (Jones 2011; Heidenrich 2001). Through the International Criminal Court (ICC), wartime atrocities can be brought to justice with the principle of universal jurisdiction, which has been bolstered by the International Tribunals for the former Yugoslavia and Rwanda (Ward 2011). While significant achievements have been made in the prosecutions of war crimes, the prevention of mass atrocities requiring immediate action should remain the preferred course of action. The major challenge that policymakers, the international community, constituent organizations, and NGOs face is coordination and mobilization prior to a genocidal event. The present study demonstrates that the victims of the Srebrenica genocide had overall poor health as a result of inadequate health care prior to the start of the armed conflict. The victims showed skeletal evidence of congenital, acquired, and morphological pathologies that suggests a need for better prenatal and generalized health care. In addition, clinical research on the living population of Bosnia and Rwanda provides information that cannot be discerned from skeletal evidence, such as prevalent heart problems, lung cancers, newborn deaths, and diarrheal diseases, but that can be used along with the skeletal evidence to help identify the health risks in marginalized and vulnerable groups providing additional risk factors to assist policymakers to advocate for immediate action to prevent morbidity and mortality in the future (Willis and Levy 2000). This study may be the first to outline the health status of victims of genocide and identify group marginalization as a path to genocide.

### Table 2. Leading Causes of Death in Rwanda in 2008

<table>
<thead>
<tr>
<th>COD</th>
<th>Frequencies (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn deaths</td>
<td>29</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>17</td>
</tr>
<tr>
<td>Malaria</td>
<td>16</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>14</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>4</td>
</tr>
<tr>
<td>Injuries</td>
<td>2</td>
</tr>
<tr>
<td>Measles</td>
<td>1</td>
</tr>
</tbody>
</table>


### Table 3. Leading Causes of Death Bosnia and Herzegovina for 2002

<table>
<thead>
<tr>
<th>COD</th>
<th>Frequencies (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebrovascular disease</td>
<td>19</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>16</td>
</tr>
<tr>
<td>Inflammatory heart diseases</td>
<td>10</td>
</tr>
<tr>
<td>Trachea, bronchus, lung cancers</td>
<td>5</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>2</td>
</tr>
<tr>
<td>Colon and rectum cancers</td>
<td>2</td>
</tr>
<tr>
<td>Liver cancer</td>
<td>2</td>
</tr>
</tbody>
</table>


