Public Health Perspective
Green Burials

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Burials and Public Health Brief History

• Embalming
  • Appearance during mourning
  • Became popular during Civil War to preserve soldiers on long train rides
  • There is not a state that regulates and enforces embalming
  • Assists as a precautionary infection control measure when handling bodies

• Burials in Plymouth
  • Public Health Department serves as Burial Agent
  • Issue burial permits
  • Concerned with mortality in the Town
  • Board of Health regulations currently adhere to state regulations
GUIDE

Issues to consider in preparing for disposition of decedents

Individuals caring for deceased relatives and friends are encouraged to plan carefully and communicate in advance with any facilities and agencies that may be involved, such as a hospital, hospice, nursing home, board of health, funeral home, crematory or cemetery, to avoid confusion about the law or other requirements. There are generally two options for final disposition of a body in Massachusetts: cremation, or burial in an approved cemetery. Cremation must occur in a crematory approved by both the Massachusetts Department of Public Health and by the Massachusetts Department of Environmental Protection, and burial must occur in a cemetery that has been approved by the local board of health and authorized by the municipal government (e.g., town meeting).
Burials and Public Health

- Preparation of the body linked with infectious disease
  - One must be careful with bodily fluids
  - No other apparent disease threats
- Embalming may impaired health
  - Carcinogen - Formaldehyde
- Bodies decompose and pathogens pose no risk at < 14 days
- Public perception and myths do not help
Despite Risk, Embalmers Still Embrace Preservative

With the government declaring formaldehyde a carcinogen, these might be boom times for alternative embalming fluids — if it weren’t for the so-called everlasting effect funeral directors stake their reputations on.

“Formaldehyde is the perfect product for fixation and short-term preservation,” said Debbie Dodge, president of the Dodge Company in Cambridge, Mass., which markets embalming fluids to funeral homes. “Formaldehyde will firm up the body tissue more than any of the nonformaldehyde products out there.”

The formaldehyde industry fought the government’s designation for years, arguing that the science was fuzzy on the link between the chemical and certain cancers. Consumer advocates hope a government warning in June will spur increased demand for products with little or no formaldehyde — for items as diverse as plywood, pressed wood, wrinkle-free shirts and hair straighteners.

Among funeral directors? Not likely.

Next to arsenic, which is no longer used, undertakers insist nothing else preserves the body long enough so that it is presentable for public viewing and can be shipped. In embalming rooms across the country, the focus is on limiting exposure while still using enough of the chemical to keep the customer looking as lifelike as possible.

“Family members,” John H. Fitch Jr., senior vice president of advocacy for

Article

Mineral Contamination from Cemetery Soils: Case Study of Zandfontein Cemetery, South Africa

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Abstract: The burial of coffins may pose an environmental and health hazard since the metals that are used in coffin-making may corrode or degrade into harmful toxins. These may leach into the surrounding soils and groundwater. Very little research has been conducted world-wide on the mineral contamination potential of cemeteries and virtually none in South Africa. The aim of the study is to determine whether burial practices affect the mineral content of soils in cemeteries. This was done by comparing the mineral concentrations of soils within the Zandfontein Cemetery in Tshwane (Gauteng, South Africa) to those off-site as well as those in zones with high burial loads with those zones with fewer burials. Twenty three soil samples were collected from various sites on- and off-site and analyzed for 31 minerals using ICP-AES. It was found that mineral concentrations of soils within the Zandfontein Cemetery were considerably higher than those off-site. Soil samples in multiple burials blocks also have elevated metal concentrations. These excess metals are probably of anthropogenic origin associated with burial practices and could pose an environmental and human health hazard. Strict monitoring of water quality in boreholes in the vicinity of the cemetery is recommended.

Keywords: minerals; heavy metals; cemetery; coffins; burial load; pollution; soil
Inorganic soil contamination from cemetery leachate.

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Abstract: The increasing number of cemeteries has caused concern about the possibility of releasing hazardous chemicals and metals into the surroundings. Moreover, many studies use cemeteries for 'background' sampling. This study attempts to identify whether cemeteries are indeed good 'background' areas, or whether they themselves are sources of contamination. Possible contaminants include poisonous chemicals, such as arsenic and mercury, which were used in past embalming and burial practices: formaldehyde from current embalming practices; varnishes, sealers, and preservatives used on wood coffins; and Pb, Zn, Cu, and steel from metal coffins. This study reports on adsorbed metals in a fine-grained soil from a large cemetery in Northwest Ohio, USA. Metal analyses were performed by atomic absorption and inductively coupled plasma spectrometry. This preliminary investigation showed numerous sources of contamination, and the data support the need for further research. The results of Zn, Cu, Pb, and Fe show an increase in concentrations on-site as well as with depth, especially at the burial depth. Dramatic increases in arsenic indicate contamination from embalming fluids or wood preservatives. This study suggests concern for the quality of soil, groundwater, and nearby surficial water systems.
Burials and Public Health

- Chemicals & lots of non-eco friendly materials
- Environmental impact of burial
- Environmental impact through preparation
- Natural, social, & built environment: existing cemetery infrastructure
  - Must consider land use and available space
- Could be a source of Zombies – Just kidding!
Infectious disease risks from dead bodies following natural disasters

Riesgo de transmisión de enfermedades infecciosas por contacto con cadáveres después de desastres naturales

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ABSTRACT

OBJECTIVE: To review existing literature to assess the risks of infection from dead bodies after a natural disaster occurs, including who is most at risk, what precautions should be taken, and how to safely dispose of the bodies.

METHODS: Disease transmission requires the presence of an infectious agent, exposure to that agent, and a susceptible host. These elements were considered to characterize the infectious disease risk from dead bodies. Using the PubMed on-line databases of the National Library of Medicine of the United States of America, searching was done for relevant literature on the infection risks for public safety workers and funeral workers as well as for guidelines for the management of the dead and prevention of infection. A small but significant literature was also reviewed regarding the disposal of the dead and the contamination of groundwater by cemeteries.

RESULTS: Victims of natural disasters usually die from trauma and are unlikely to have acute or "epidemic-causing" infections. This indicates that the risk that dead bodies pose for the public is extremely small. However, persons who are involved in close contact with the dead such as military personnel, rescue workers, volunteers, and others may be exposed to chronic infectious hazards, including hepatitis B virus, hepatitis C virus, HIV, enteric pathogens, and Mycobacterium tuberculosis. Suitable precautions for these persons include training, use of body bags and disposable gloves, good hygiene practice, and vaccination for hepatitis B and tuberculosis. Disposal of bodies should respect local custom and practice where possible. When there are large numbers of victims, burial is likely to be the most appropriate method of disposal. There is little evidence of microbiological contamination of groundwater from burial.

CONCLUSIONS: Concern that dead bodies are infectious can be considered a "natural" reaction by persons wanting to protect themselves from disease. However, clear information about the risks is needed so that responsible local authorities ensure that the bodies of disaster victims are handled appropriately and with due respect. This paper provides a source of information for those who are in the unfortunate position of managing those bodies.
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Green Burials and Public Health

• Natural
• Environmental impact of burial is minimal to none
• Environmental impact through preparation is minimal to none
• Decomposition is quicker; be mindful of bodily fluids
• Natural, social, & built environment: existing cemetery infrastructure
  • Integrating landscapes of death into community life for improved
Next Steps

• Town Cemetery Superintendent
• Board of Health regulatory requirements for green burials
• Public Health Department enforcement
• Educate the public
• Incrementally change perception about disease risk
• Understand the current science and use common sense
Discussion of Questions