The environmental implications of medical waste disposal in England

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Introduction

• Healthcare facilities generate a diverse range of waste types with multiple waste streams for safe treatment and disposal.

• Some waste must be incinerated while multiple possible disposal routes exist for others.

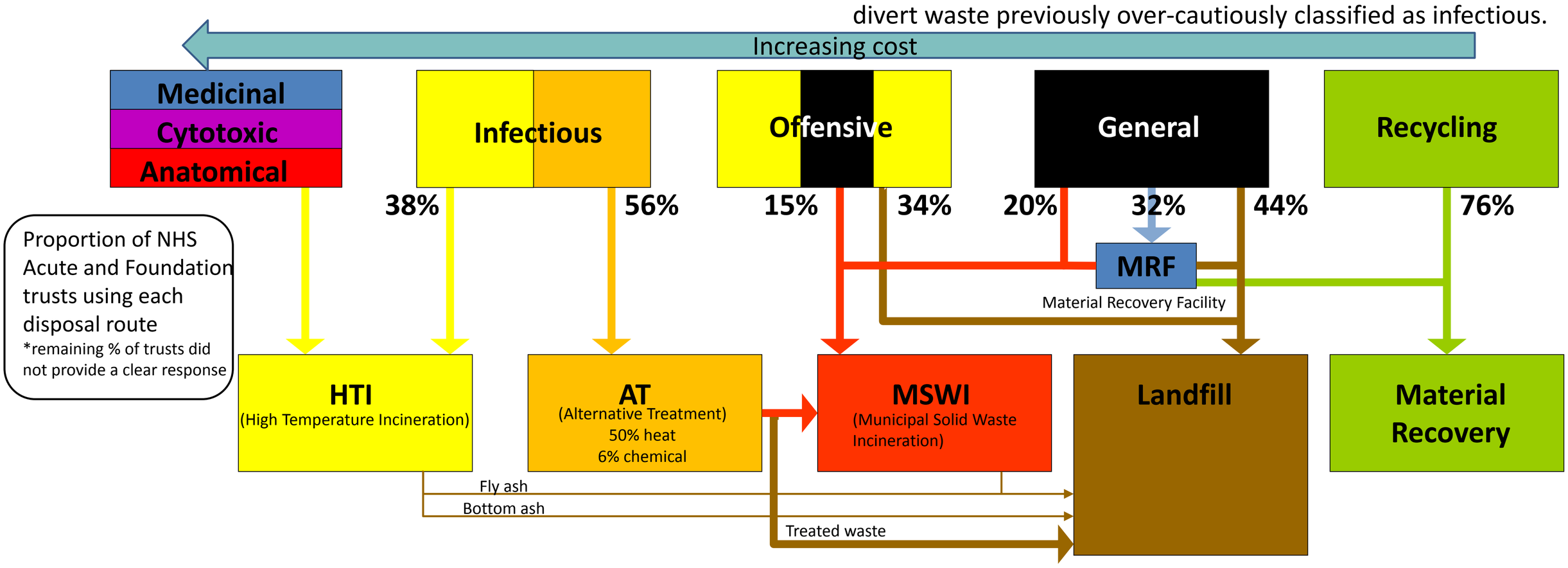
• Environmental concerns exist, particularly for incineration. However, the environmental impacts of the alternatives must also be considered

Current Practice

• All hospitals have an infectious and general waste stream. Interpretations of 'infectious' differ, affecting the quantity and composition of waste in each stream.

• Many hospitals use AT for infectious waste, diverting this from HTI for financial and sometimes assumed environmental reasons.

• Use of the offensive waste stream is increasing to further divert waste previously over-cautiously classified as infectious.



Environmental Impacts

	Infectious HTI	Infectious AT	Offensive	General	Recycling
Burdens	Direct emissions to air: Greenhouse, toxic to ecosystem and human health Hazardous fly and bottom ash requiring disposal	Indirect emissions from: -energy consumption and other resources -Waste water treatment -Disposal of treated waste	Direct emissions to air: Similar to HTI Hazardous fly ash requiring disposal	Release of pollutants through landfill gas and leachate not captured Places pressure on diminishing landfill space	Indirect emissions from energy consumption and other resources
Benefits	*Energy can be recovered* *(but many HTIs in England have no or inefficient energy recovery)* *Reduces waste sent to landfill*	*Metal recovery for recycling is possible* *Reduction in waste volume (for heat AT)*	*Energy and metal can be recovered* *Bottom ash can be re-used as an aggregate* *Reduces waste to landfill*	*Energy can be recovered from captured landfill gas*	*Recovered materials can displace virgin materials* *Reduces quantities requiring incineration or landfilling*

What can waste producers do?

•Appropriate use of the general and offensive waste streams can divert significant quantities of waste from the infectious HTI and AT streams.

•Environmental savings are achieved by eliminating the decontamination process for waste previously sent for AT.

•Diversion from HTI can reduce associated emissions but may also have a negative effect on operation, increasing emissions, due to changes in waste composition.

e.g the higher proportion of metal and glass increases the risk of slag build up leading to more frequent shut-downs. Much higher concentrations of dioxins are produced during start-up and shut-down[1] and large amounts of energy are required for start-up, increasing emissions per kg waste treated.

Conclusions and Future Work

•A range of disposal routes exist for medical waste, all of which have some negative impacts on the environment.

•Incinerators release a range of polluting and toxic gases. However, if sufficient energy is recovered and displaces a more polluting source, this can be environmentally superior to other disposal options.

•Further research into the comparative impacts of different disposal options is required.

References

Wang, L.C. et al., 2007. Influence of start-up on PCDD/F emission of incinerators. *Chemosphere*, 67(7), pp.1346–53.

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