**Ideas to “green” the Pharma industry**

***Introduction.***

There is increasing interest in creating a sustainable, circular or regenerative economy. Although pharmaceuticals are taken by humans and animals and then biodegraded by their biological systems, the process of production and distribution of pharmaceuticals has a large carbon footprint.

Pharmaceuticals are by far the largest element of the NHS carbon footprint producing 5+ million tonnes of carbon annually. (See chart) There are 2.7m prescriptions per day creating an estimated an annual 2.7 billion non-degradable blister packs destined for landfill or incineration.

Some 20% of all pharmaceuticals prescribed are not taken.

***1. Blister packs.***

Difficult to recycle (a mixture of plastic and aluminium glued together). Only one company in the UK able to recycle (Terracycle), they have reached their capacity for recycling and are no longer accepting new customers.

**Questions.** Is it possible to redesign blister packs to make them more easily recycled? Is it possible to improve the recycling process for existing blister packs? Is it possible to redesign the pharmaceutical distribution process from production to consumption (factory to patient). Need to consider the costs of recycling.

**2. Distribution of pharmaceuticals.**

The traditional method of distribution is from factory to distribution centre, to local pharmacies and hospitals, to be collected by individuals or distributed by the pharmacy to largely care homes

The process of prescription and dispensing is hampered by human error.

A significant proportion of prescribed medicines are not actually taken by patients and are then difficult to dispose of as they cannot be recycled easily.

Some patients have dosette boxes (containing a month’s supply of medicine) which are filled by local pharmacists from individual blister packs, the dosette boxes are then returned and renewed by local pharmacists.

**Questions.** Would it be possible to design a dosette box with individual wireless sensors for each day of the month to first alert, by mobile phone, the patient that medicine needs to be taken, and alerts medical services or carers if medicine has not been taken for a defined period of time.

Could the dosette boxes be filled at a central distribution point using electronic prescribing, robotic dispensing, eliminating blister packs entirely, with direct distribution to patients homes with collection of used dosette boxes? Could these dosette boxes either be made from easily recyclable materials or materials that are easily cleaned and reused?

