Storage of Medicines

Daphne Coleiro, Anthony Serracino-Inglott, Lilian M. Azzopardi
Department of Pharmacy, Faculty of Medicine and Surgery, University of Malta, Msida, Malta
Email: dcol0007@um.edu.mt

University of Malta

INTRODUCTION

Maintaining a community pharmacy at 25°C in the local scenario, where during the summer months the temperature is normally above 30°C, requires a large investment in electricity bills.The impact of exposing medicinal products to temperatures outside room temperature (maximum of 25°C) and fridge temperature (2 - 8°C) is not well documented.

AIMS

- To compile storage conditions for medications.
- To recommend methods of storing pharmaceuticals in the most efficient manner while saving on electricity consumption and carbon dioxide emissions.

METHOD

- Storage conditions were compiled for the medications listed in the Marketing Authorisation list - Revision 48 - 06/2010 of the Malta Medicines Authority.
- Recommended storage conditions were gathered from published research papers, the Summary of Product Characteristics and from the Patient Information Leaflets.[1,2]
- When data was not available, the manufacturing companies was directly contacted and asked to provide storage data for each product, specifically for the Maltese climate zone.
- The rate of heat loss in a typical Maltese pharmacy was investigated.
- A plan of such a pharmacy premises together with the necessary temperature control measures required to achieve temperature controlled storage conditions in the most efficient manner was proposed.
- A pharmacy plan (Figure 1) was developed depicting a 60m² pharmacy area, consisting of a main dispensing area and two stores linked to the dispensing area. Both stores have access to an external area. It is assumed that on either sides of the pharamcy there are third party buildings. For efficient temperature control, such a pharmacy would need to be equipped with an air conditioner in each room.

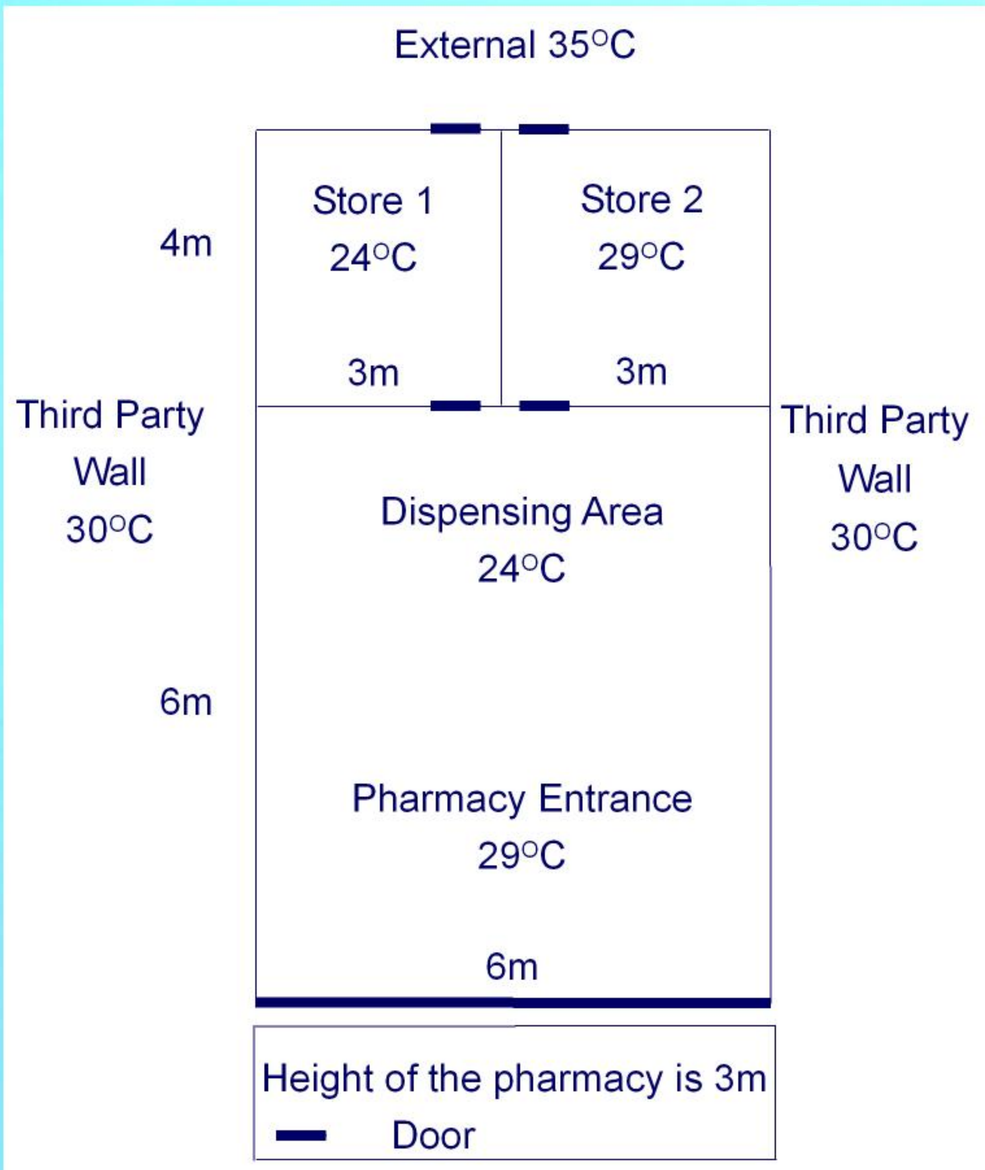

Figure 1: A typical Maltese pharmacy plan.

RESULTS

Out of a total of 1794 medications were reviewed which can be stored at room temperature; 1039 medications should be stored below 25°C, 414 should be stored below 30°C, 4 medications below 37°C, 334 have no special temperature storage conditions and 3 medications should not be exposed to temperatures above 50°C due to the presence of pressurised gas.

Figure 2: A graph showing the reduction in electricity costs.

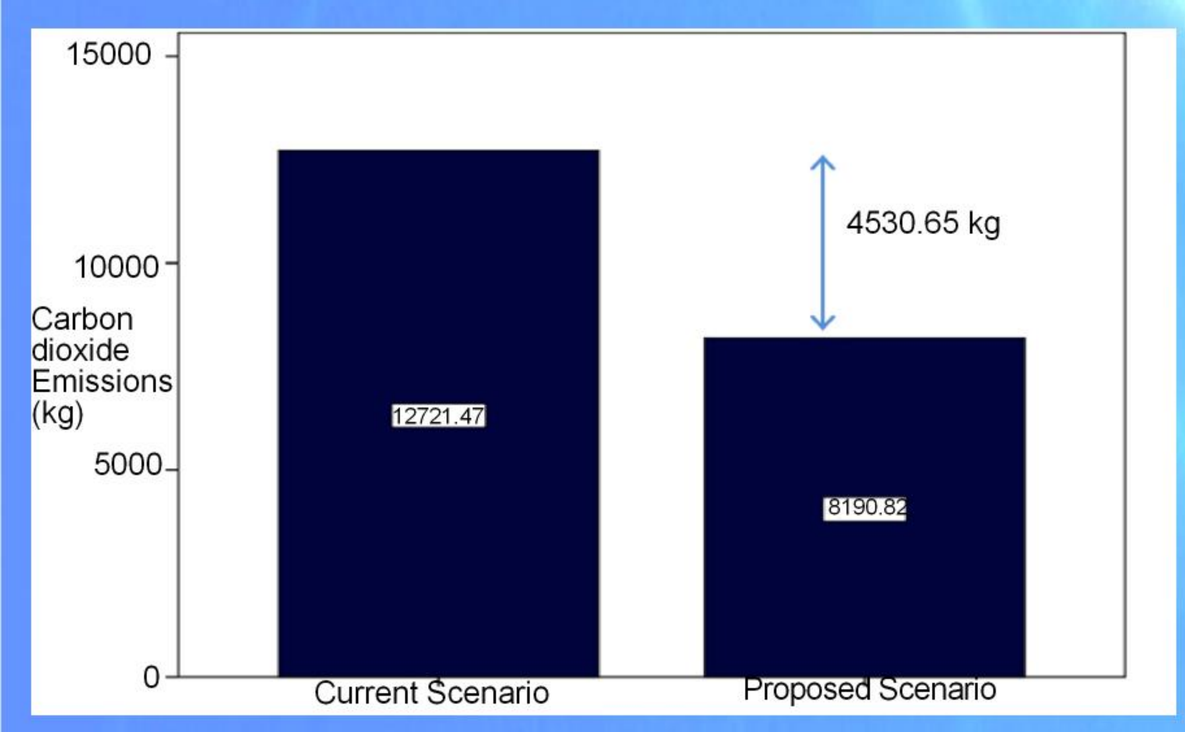

Figure 3: A graph showing the reduction in Carbon dioxide emissions.

DISCUSSION

A practical solution to minimise air-conditioning electrical consumption costs is to group medicines according to the maximal temperature storage conditions permitted and store them in different isolated areas of the pharmacy. 1039 medicinal products (stable below 25°C) should be stored in store 1 and in the dispensing area of the pharmacy. The remaining 755 medications (stable below 30°C or 40°C) are stored separately in store 2. The air conditioning temperatures should be set to 24°C and 29°C respectively, ensuring that all medications are stored in accordance to their storage requirements, maintaining the stability.

Electrical efficiency and reduction in carbon dioxide emissions were calculated. For one pharmacy, over Euro 750 (Figure 2) and over 4500 kg of Carbon dioxide (Figure 3) can be saved during the summer (5 months in Malta) where high temperatures are reached. These figures were worked out on the current electricity cost in Malta, where 1 kWh costs Euro 0.16 and 1 kWh produces 0.871 kg of Carbon dioxide and assuming the air conditioners are 60% efficient. Taking into consideration all the 215 pharmacies in the Maltese islands, a total of Euro 150,500 can be saved and around 860,000 kg of Carbon dioxide can be avoided every summer.

REFERENCES

[1] Cohen V, Jellinek S, Teperikidis L, Berkovits E, Goldman W. Room-Temperature storage of medicines labeled for refrigeration. Am J Health Syst Pharm. 64, 1711-1715. (2007).

[2] Strawbridge JD, Van den Dungen A, O'Leary P. Guarding the cold chain - Y2K and beyond. The Mater Misericordiae Hospital. Dublin. (2008).