

Healthcare Resource and Financial Implications of an Environmentally Driven Switch in Respiratory Inhaler Use in the English NHS

Darush Attar-Zadeh¹, Harriet Lewis², Martina Orlovic³

¹Barnet Clinical Commissioning Group, London, UK; ²Chiesi Ltd, Manchester, UK; ³Chiesi Farmaceutici S.p.A, Parma, Italy

Background

- NHS England committed to reduce 80% of its direct emissions by 2028 to 2032.¹ The inhaler market was identified as one to help reach this target.
- The most commonly used inhaler devices among asthma and chronic obstructive pulmonary disease (COPD) patients are: 1) pressurised Metered Dose Inhaler (pMDI) and 2) Dry Powder Inhaler (DPI). pMDIs are associated with more greenhouse emissions compared to DPIs.
- NHS England introduced administratively driven policies to rapidly switch certain patients from pMDIs to DPIs to reduce CO2 emissions.
- The implications of implementing such policy remain not well understood.

Objectives

- To assess the potential financial and resource impact of patients with asthma or COPD being switched from pressurised metered-dose inhalers (pMDI) to dry powder inhalers (DPIs) in both a representative primary care network (PCN) of 50,000 population and the English National Health Service (NHS).

Methods

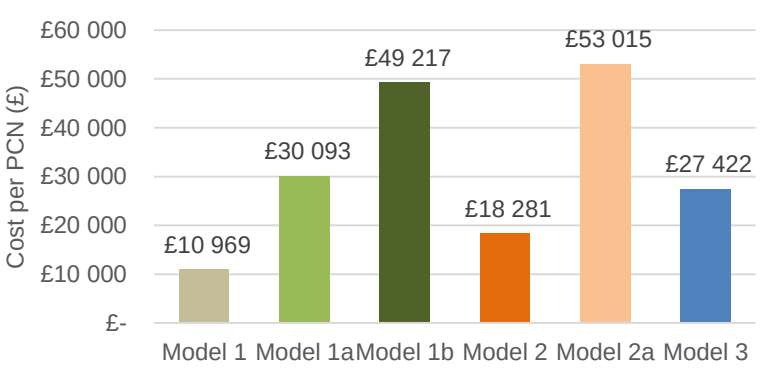
- Current patterns of inhaler use in England and epidemiological data were used to model the resources and costs associated with implementing this switch (Table 1).
- Three scenarios were modelled with varying assumptions of the patient acceptance of the transition and additional resources required for patient counselling and switch management should a switch occur (Table 2).

Table 1. Epidemiological and inhaler usage estimates	Asthma	COPD
Epidemiological parameters		
Prevalence, % ²	6.05	1.93
Population of England, n ³	56,287,000	56,287,000
Concomitant asthma and COPD diagnosis, % ⁴	14.8	
Adjusted prevalence for ACOS, %	5.15	1.93
Population estimates		
Patients in England, n	3,405,364	1,086,339
Patients in a 50,000 population PCN, n	3,025	965
ACOS adjusted patient numbers for England, n	2,901,370	1,086,339
ACOS adjusted patient numbers per 50,000 patients, n	2,577	965
Inhaler usage parameters ⁵		
pMDIs only, %	71	39
pMDIs only in England, n	2,069,796	425,498
pMDIs only per 50,000 patients, n	1,839	378
pMDIs and DPIs, %	3	16
pMDIs and DPIs in England, n	75,002	173,658
pMDIs and DPIs per 50,000 patients, n	67	154

Table 2: Resource inputs for service models	Resource input
Model 1 – “Minimal service”	
Time spent managing the switch, minutes	5
Pharmacist costs per hour, £	54
Model 1: Patients nonadherent, %	0
Model 1a: Patients nonadherent, %	20
Model 1b: Patients nonadherent, %	40
GP costs per consultation, £	39.23
Model 2 – “Opportunistic approach”	
Time spent managing the switch, minutes	5
Pharmacist costs per hour, £	54
Practice nurse costs per hour, £	42
Pharmacist inhaler counselling, %	25
Practice nurse inhaler counselling, %	75
Model 2a: Proportion of patients nonadherent, %	60
Model 2a: Follow up appointment, pMDIs only, minutes	15
Model 3 – “Gold standard”	
Time spent managing the switch, minutes	15
Pharmacist costs per hour, £	54
Practice nurse costs per hour, £	42
Pharmacist inhaler counselling, %	25
Practice nurse inhaler counselling, %	75
Proportion of patients nonadherent, %	10
Follow up appointment, pMDI cohort only, minutes	15

Results

- In England, 71% of asthma and 39% of COPD patients use pMDI inhalers, while 3% of asthma and 16% of COPD use both inhaler devices.
- Additional costs to implement this policy ranged from £11K–£53K for a PCN, and from £12m–£60m for English NHS depending on the assumptions (Figure 1).



Conclusions

- Switching inhaler devices for environmental reasons alone is a complex activity that should be evaluated looking at individual and organisational factors.
- Targeted transition of inhalers must achieve a balance between environmental impacts, organisational factors and patient requirements.
- The cost and time implications for managing a switch can be substantial and should be considered by the health service in case this action is implemented, in order to appropriately counsel and support patients.

REFERENCES 1 NHS England. Delivering a ‘Net Zero’ National Health Service, October 2019, NHS; 2 NHS Digital. Quality and Outcomes Framework (QOF): Achievement, Prevalence and Exceptions 2020 [Accessed September 30, 2020]; 3 Office for National Statistics. England population estimates 2020 [Accessed April 15, 2021]; 4 Nissen F, Morales DR, Mullerova H, Smeeth L, Douglas IJ, Quint JK. Concomitant diagnosis of asthma and COPD: a quantitative study in UK primary care. Br J Gen Pract. 2018;68(676):e775-e82; 5 IQVIA. Longitudinal Patient Data (LPD), incorporating data derived from THIN, A Cegedim Database. London: IQVIA; 2020.