



Reducing carbon emissions and improving clinical outcomes through a review targeting SABA (short acting beta-agonist) inhaler overuse in a primary care setting

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WHY?

- Pressurized metered dose inhalers (pMDIs) use hydrofluorocarbons as a propellant; these are **powerful greenhouse gases**
- Alternative inhaled devices, such as dry power inhalers (DPIs) and soft mist inhalers, have a much lower carbon footprint
- Due to high levels of pMDI prescribing, inhalers are a 'carbon hotspot' in the NHS, thought to account for around **3% of its overall carbon footprint** in England (1)
- The most commonly prescribed pMDIs are reliever inhalers containing a short acting beta agonist (SABA) e.g. salbutamol
- For patients with asthma, **use of 3 or more reliever inhalers per year** is associated with **poorer disease control** (2)
- There are therefore both **environmental** and **patient care** reasons to address pMDI SABA overprescribing

Irvinestown Health Centre is a GP practice located in a rural area in Northern Ireland with a practice population of about 7800

Prior to 2022 the practice had higher than local average prescribing rates of SABA inhalers



PROJECT AIM: to reduce levels of pMDI prescribing and improve patient outcomes through a targeted review of patients ordering >8 pMDI SABA inhalers in 1 year

- Delivering a 'Net Zero' National Health Service. Accessed on 22/6/23 from <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf>
- Bloom CI, Cabrera C, Arnetorp S, Coulton K, Nan C, van der Valk RJP, Quint JK. Asthma-Related Health Outcomes Associated with Short-Acting β 2-Agonist Inhaler Use: An Observational UK Study as Part of the SABINA Global Program. Adv Ther. 2020 Oct;37(10):4190-4208. doi: 10.1007/s12325-020-01444-5. Epub 2020 Jul 27. PMID: 32720299.
- Bulletin 295: Inhaler carbon footprint. PrescQUIPP Community Interest Company. Accessed on 1/9/23 from <https://www.prescquipp.info/our-resources/bulletins/bulletin-295-inhaler-carbon-footprint>
- Carbon footprint of selected modes of transportation in the United Kingdom in 2023. Statista. Accessed on 1/9/23 from <https://www.statista.com/statistics/1233337/carbon-footprint-of-travel-per-kilometer-by-mode-of-transport-uk/>

Image: accessed on 22/6/23 from <https://en.wikipedia.org/wiki/Irvinestown>

HOW?

A practice database search on 25/8/22 identified **68 patients** who had been prescribed **8 or more** pMDI SABA inhalers within the preceding 12 months

52 - Asthma
4 - COPD
7 - Asthma/COPD overlap
5 - Other diagnoses

31% (21/68) had had **no exacerbations** of their respiratory condition during the preceding year, **26%** (18/68) had had **4 or more exacerbations**

Just over half (37/68) had received a **respiratory-focused review** in primary or secondary care in the preceding year

Baseline data was used to place patients in 3 groups:

- High priority for review (43)**
- Low priority for review (10)**
- Not currently needing review (15 – all reviewed in preceding year)**



Between 12/12/22 and 21/3/23 42 (out of 43) patients deemed high priority were reviewed by phone by a GP

At least 14 went on to have a face to face appointment with a practice nurse

Outcomes following initial review process:

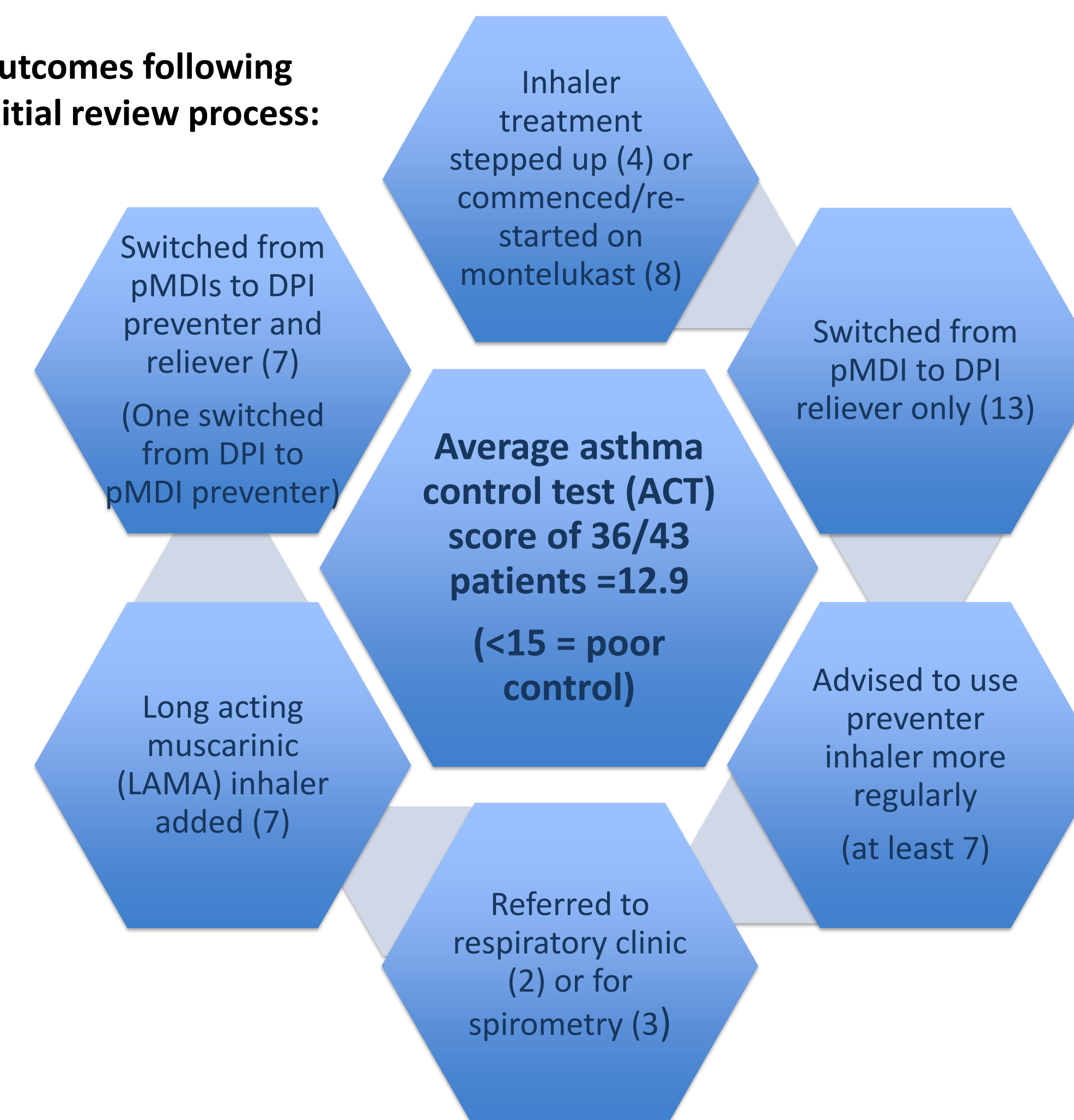


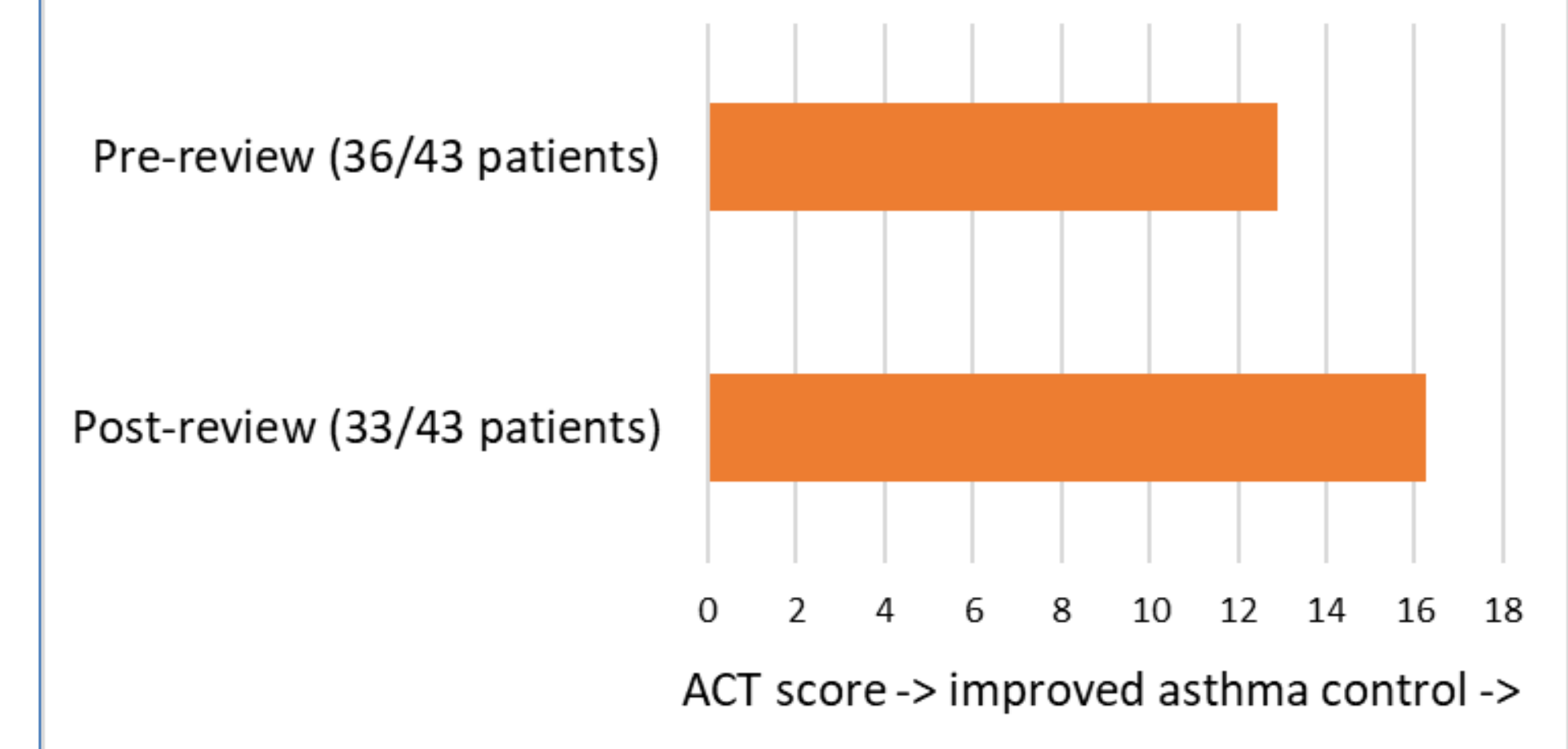
Image: accessed on 22/6/23 from <https://rcni.com/nursing-standard/newsroom/news/new-guide-health-professionals-helping-patients-use-inhalers-correctly-75131>

FINDINGS? WHAT NEXT?

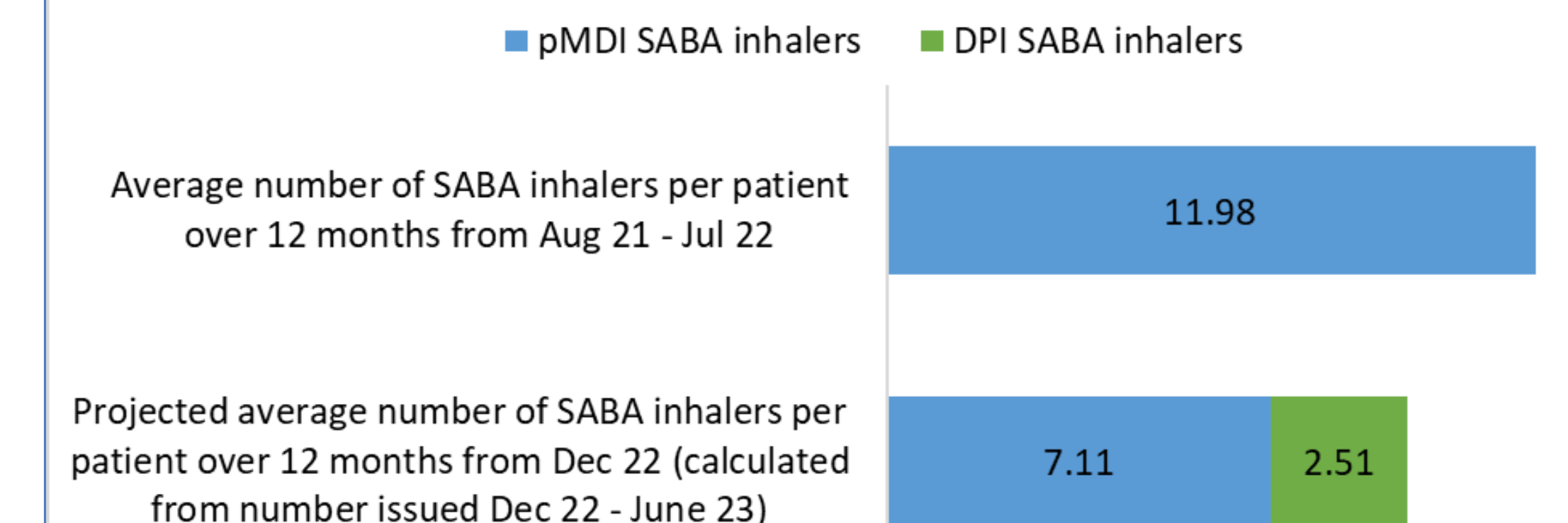
The 43 patients in the high priority for review group were contacted by phone by a nurse practitioner/GP and/or had their records reviewed in Jun-July 23

The project appears to have achieved its aims of simultaneously reducing pMDI prescribing and improving patient outcomes (though seasonal factors may have contributed to improvements in ACT scores in summer 23)

Mean ACT score pre and post review



Average number of pMDI and DPI SABA inhalers issued per patient before and after review



Assuming all pMDI salbutamol prescribed is Salamol brand (11950g CO₂e per inhaler) and all DPI salbutamol prescribed is Easyhaler salbutamol brand (620g CO₂e per inhaler), it is possible the project has saved **2426.47 kg CO₂e** SABA-related emissions over 1 year post review (equivalent to driving 9194 miles in an average petrol car) (3,4)

A further reduction in inhaler-related CO₂ emissions will have been achieved through the successful switch of **5 patients** from pMDI to DPI preventer inhalers

It's likely the project has contributed to an **increase in monetary prescribing costs** due to switches and additional treatments prescribed, however cost savings may be achieved in the longer term through patients achieving improved disease control

Future direction: explore the role of MART (maintenance and reliever therapy) amongst patients with poor disease control on standard regimens