

Carbon Footprint Impact of Breezhaler® Dry Powder Inhaler for Asthma:
An Analysis in UK and Italy

POS87

Choubey A¹, Marvel J², Ishikawa R², Kaur H¹, Tedeschi A³, Ritrovato D³, Sydnor S⁴, Thokala P⁵

¹Novartis Healthcare Private Limited, Hyderabad, India; ²Novartis Pharma AG, Basel, Switzerland; ³Novartis Farma, Origgio, Italy; ⁴Novartis Pharmaceuticals, London, UK; ⁵PT Health Economics Ltd, Sheffield, UK

INTRODUCTION

- Climate change due to carbon emissions (or carbon footprint) is impacting human lives and health across the globe^{1,2}. Many countries (>130) aim to reduce these emissions to net zero by mid-century³.
- The health sector accounts for 4.4% of global GHG emissions⁴ and policy interventions to reduce climate impacts are being increasingly considered by healthcare decision-makers in many countries, such as the National Health Service (NHS) in England and Ministero della transizione ecologica in Italy.
- Carbon footprint of dry powdered inhalers (DPIs) is 25 times lower compared with pressurised metered-dose inhalers (pMDIs). NHS England plans to reduce the climate change impact of asthma inhalers and estimates that a shift to lower carbon inhalers will deliver a 4% reduction in its carbon footprint by 2025⁶.

OBJECTIVE

- An analysis was conducted to estimate the reduction in carbon dioxide equivalent (CO₂e) emissions related to once-daily indacaterol acetate/mometasone furoate (IND/MF) and once-daily indacaterol acetate/ glycopyrronium bromide/ mometasone furoate (IND/GLY/MF).
- Both IND/MF andl ND/GLY/MF are delivered by the Breezhaler® DPI device for the treatment of moderate-to-severe uncontrolled asthma. In this analysis, we compared these treatments to existing inhalers in the UK and Italy over a period of 5 years.

METHODS

- CO₂e emission values for the Breezhaler® device + IND/GLY/MF or IND/MF and comparators were obtained from a life-cycle assessment study [data on file] and published literature, respectively.
- Other key inputs included market share of considered drugs, prevalence of disease and drug dosage. The amount of savings in CO₂e emissions was translated into

various daily activities in order to estimate what would be required to offset the impact of the carbon footprint. A schematic of the methodology and CO₂e emission values associated with various examples of daily activities considered in this analysis are shown in **Figure 1** and **Figure 2**, respectively

Figure 1: Methodology

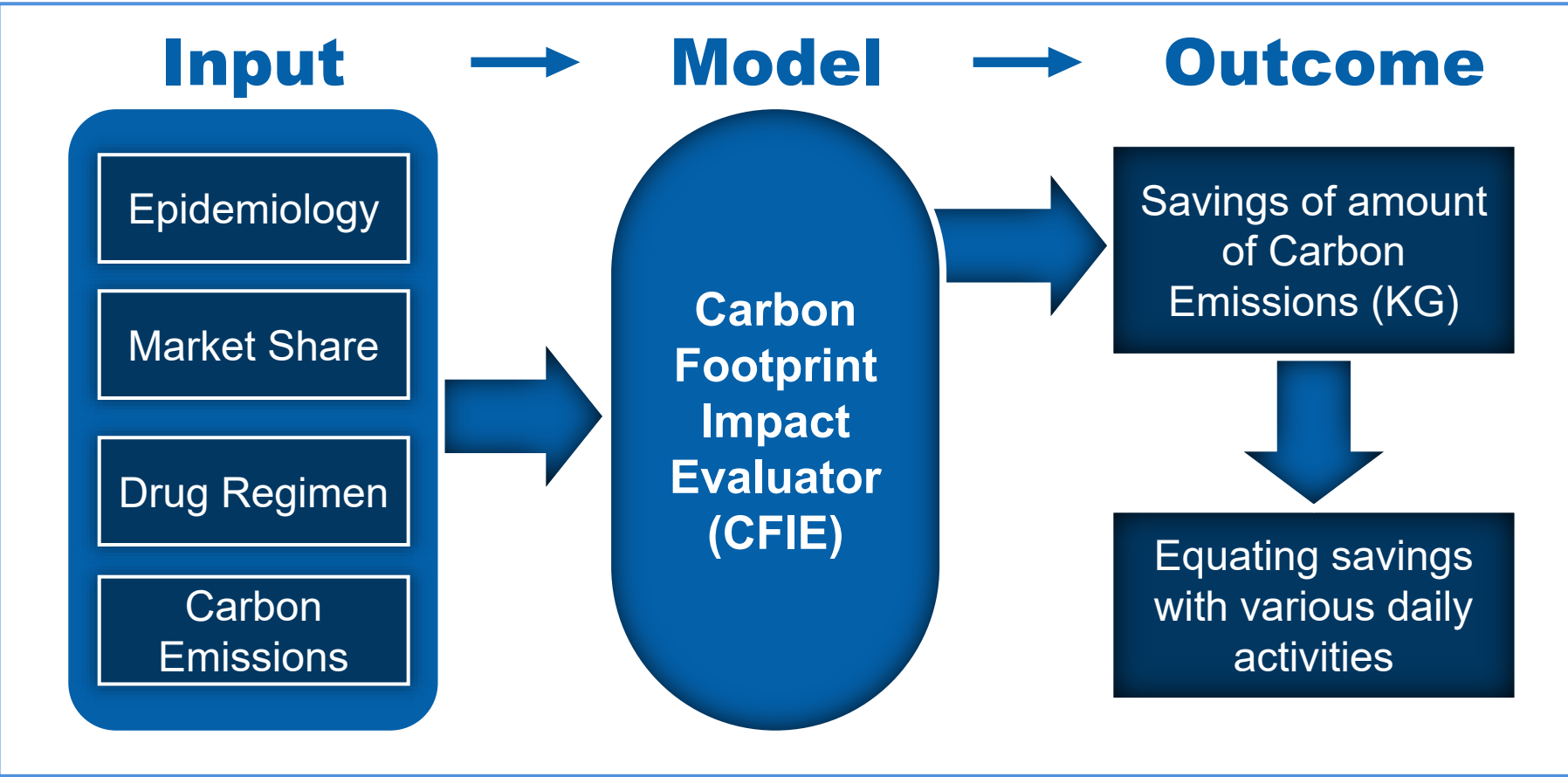


Figure 2: Average CO₂e emission values associated with various examples of daily activities

Average CO ₂ e emissions by 1 Boeing 747 in 1 Hour of flight is 250 kilograms. The flight time from London to New York is approx. 8 hours ⁷
Average CO ₂ e emissions from 1 gallon of gasoline and 1 gallon of diesel is 8.887 kilograms and 10.187 kilograms, respectively ⁸
Average CO ₂ e absorption by 1 tree in 1 year is 24 kilograms ⁹
Average daily CO ₂ e emissions associated with food produced for 1 meat eater and 1 vegetarian is 3300 kilograms and 1500 kilograms, respectively ¹⁰

Results

- Assuming a 10% market share over the next 5 years, IND/GLY/MF Breezhaler® would result in the respective reduction of approximately 4.9 and 0.8 million Kg of CO₂e emissions in the UK and Italy, which is equivalent to approximately 2 million litres or 300,000 litres of gasoline consumption.
- The reduction in carbon emissions would also be equivalent to planting approximately 40,000 and 6,600 new trees in the UK and Italy, respectively. Detailed results are presented in **Figure 2** and **Figure 3**.

- As the carbon footprint in the environment was similar for IND/GLY/MF Breezhaler® and IND/MF Breezhaler® in the UK, the environmental benefits were also similar for both treatments (**Figure 3**).
- However, the carbon footprint in the environment for IND/GLY/MF Breezhaler® and IND/MF Breezhaler® varied for Italy (due to differences in the size of the target population, and thus the environmental benefits also varied) (**Figure 4**).

Figure 3: Cumulative savings in carbon emissions with IND/GLY/MF Breezhaler® and IND/MF Breezhaler® over 5 years in UK

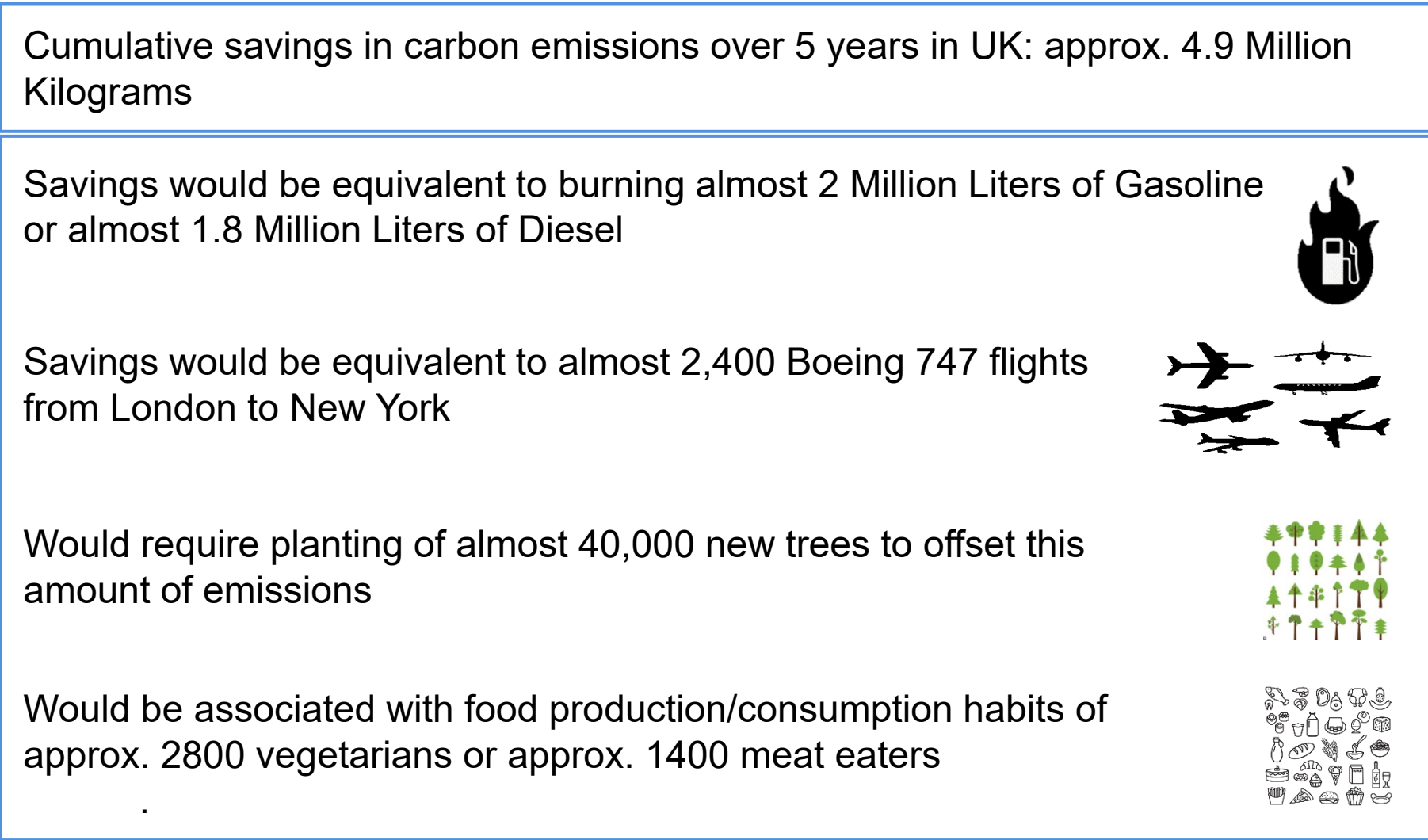
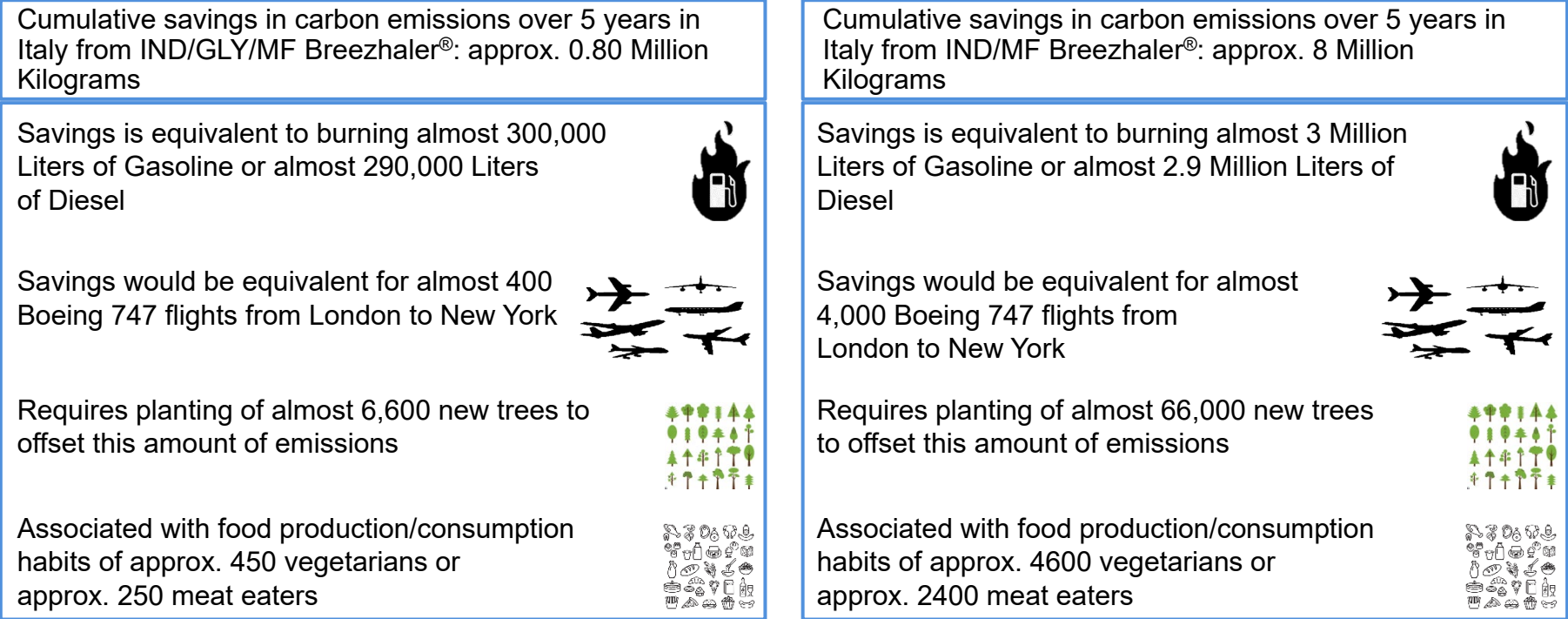


Figure 4: Cumulative savings in carbon emissions with IND/GLY/MF Breezhaler® and IND/MF Breezhaler® over 5 years in Italy



Conclusions

- Increasing the use of Breezhaler® dry powdered inhaler (DPI) would result in environmental benefits in both UK and Italy. These data may help inform policy discussions and encourage decision-makers to consider the environmental impact associated with the type of asthma inhalers used alongside the standard reimbursement process.
- These data may also inspire the pharmaceutical industry to consider the impact of greenhouse gas emissions generated in their product development programs.

References

- World Health Organisation. WHO calls for urgent action to protect health from climate change – Sign the call. Available from: WHO calls for urgent action to protect health from climate change – Sign the call
- Watts N, et al. The Lancet 2018;392(10163):2479–2514.
- United Nations-Climate Action. Available from: Net Zero Coalition | United Nations
- Health Care’s Climate footprint. How the health sector contributes to the global climate crisis and opportunities for action. Available from: HealthCaresClimateFootprint_092319.pdf (noharm-global.org)
- World Asthma Day: counting the environmental cost of common inhalers. Available from: Inhaler emissions: the hidden environmental cost of asthma (medicaldevice-network.com)
- The NHS Long Term plan. Available from: NHS Long Term Plan v1.2 August 2019
- Aviation. Available from: Aviation (carbonindependent.org)
- Greenhouse Gas Emissions from a Typical Passenger Vehicle. Available from: Greenhouse Gas Emissions from a Typical Passenger Vehicle | US EPA
- Grow Trees-Offset. Available from: Offset (grow-trees.com)
- Food’s Carbon Footprint. Available from: Carbon Footprint of Food | Green Eat

Acknowledgements

The authors were assisted in the preparation of the poster by Harneet Kaur (Novartis).
Copyright© 2021 Novartis Pharma AG. All rights reserved
The study was funded by Novartis Pharma AG, Basel, Switzerland

Poster presented virtually at the Virtual ISPOR Europe 2021, November 30–December 3, 2021



Scan this QR code