

SUPPLEMENTARY MATERIAL

Appendix 1. Definition of asthma drug therapy and R03 codes by pharmacologic action

Asthma drug therapy included inhaled corticosteroids (ICS), Long-acting β -agonists (LABAs), LABA–ICS fixed combinations, short-acting β -agonists (SABAs), anticholinergics, anticholinergics–SABA fixed combinations, xanthines, cromones and IgE antagonists (R03 according to ATC classification). Drugs of the ATC R03 class having no theoretical indication in asthma (Pneumorel® R03DX03, Combivent® R03AK04, Onbrez® R03AC18, Daxas® R03DX07, Seebri® R03BB06, Ultibro® R03AL04) were included since they were likely to be prescribed in practice for the treatment of symptoms of asthma.

| Asthma therapy | Anatomical Therapeutic and Chemical (ATC) classification |
|--|--|
| Inhaled corticosteroids (ICS) | R03BA01 |
| | R03BA02 |
| | R03BA05 |
| | R03BA08 |
| Long-acting β -agonists (LABA) | R03AC12 |
| | R03AC13 |
| | R03AC18 |
| | R03AL04 |
| Fixed associations ICS/LABA | R03AK06 |
| | R03AK07 |
| | R03AK08 |
| Leukotriene receptor antagonist (LTRA) | R03DC03 |
| Xanthines | R03DA04 |
| | R03DA08 |
| Cromones | R03BC01 |
| | R03BC03 |
| IgE antagonists | R03DX05 |
| Short-acting β -agonist (SABA) | R03AC02 |
| | R03AC03 |
| | R03AC04 |
| | R03AC08 |
| Anticholinergics | R03BB01 |
| | R03BB02 |
| | R03BB04 |
| | R03BB06 |

Appendix 2. Secondary outcomes of interest measured over a period of 12 months.

| Core domains | | Outcome |
|------------------------|--|--|
| Process outcomes | | |
| | Indicators of asthma control | |
| | | Proportion of patients dispensed four or more SABA* |
| | | |
| | Controller medications | |
| | | Proportion of patients dispensed at least one controller medications |
| | | Proportion of patients with sustained use of controller medications that is to say dispensation of five or more units of ICS (in fixed association with LABA or not) or eight or more units of LTRA. This definition was derived from a scoping study provided by the CNAM (data not published) |
| | Reliever+ controller medications (Total R03) | |
| | | Total asthma prescriptions dispensed ICS, LABA, LABA-ICS fixed combinations, SABA, anticholinergics, anticholinergics-SABA fixed combinations, xanthines, cromones and IgE antagonists |
| | Adherence to asthma controller medication (ICS alone or in fixed combination with LABA) | |
| | | Medication Refill Adherence (MRA) to controller asthma medications > 80%. MRA is the compliance indicator recommended by a review of the literature on compliance indicators estimated from medico-administrative databases. ¹⁶ The method of calculating MRA is to divide the total number of days in the observation period for which the patient is provided with drugs by the number of days in the study period minus the number of hospital days, multiplied by 100. The number of days for which the patient is provided with medicines can be calculated by multiplying the number of deliveries during the period studied by the daily average dose (number of DDD or Defined Daily Dose per pack) |
| Healthcare utilization | | |
| | Urgent care visits | |
| | | Proportion of patients with a least one asthma-related hospitalization. Hospitalization for asthma was defined using primary diagnosis or related diagnosis codes for asthma |
| | | Proportion of patients with a least one ER visits defined as: <ul style="list-style-type: none"> – R03 and / or oral or injectable systemic corticosteroid prescription dispensed within seven days following the ER visits – and / or GP visits for exacerbation of asthma within seven days following an ER visits. This definition captures ER visits during which the emergency physician did not deliver anti-asthmatic medication but directed the patient to the GP – and / or consultation with the pulmonologist (primary care or outpatient clinic) within seven days of an ER visit |
| | | Proportion of patients with a least one GP visit for asthma exacerbation, defined as dispensation of oral or injectable corticosteroids within seven days of the GP visit |
| | Routine visits | |

| | | |
|-------------------------------|-------------------------|---|
| | | Proportion of patients with a least one routine GP visit for asthma, defined as dispensation of R03 drugs within seven days of the GP visit |
| | | Proportion of patients with at least pulmonologist visits |
| | | Proportion of patients with at least one pulmonary function testing |
| Patient-level outcomes | | |
| | Exacerbations | |
| | | Proportion of patients with at least one asthma exacerbation defined as prompting hospitalization, ER visits room or a visit to the GP for exacerbation (see above) |
| | Work absenteeism | |
| | | Number of sickleave days related to asthma |
| | | Proportion of patients with at least one sickleave episode related to asthma |
| | | Number of days of sickleave days related to asthma among those who had one or more days of sickleave days related to asthma |

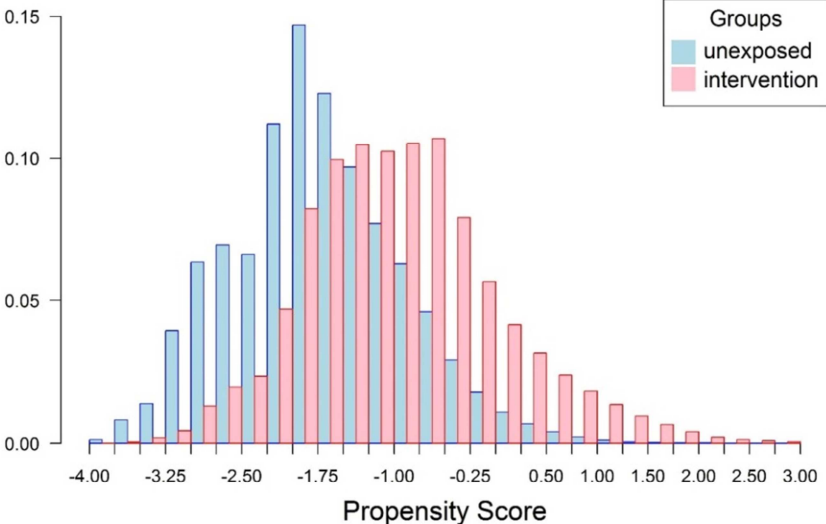
ER, emergency room; GP, general practitioner; SABA, short-acting β -agonist; LABA: long-acting β -agonist; ICS, inhaled corticosteroids.

*Corrélations entre asthme déclaré et remboursements de médicaments dans l'enquête ESPS 2006 / 2012 / Maladies chroniques et traumatismes / Rapports et synthèses / Publications et outils / Accueil.
<http://invs.santepubliquefrance.fr/Publications-et-outils/Rapports-et-syntheses/Maladies-chroniques-et-traumatismes/2012/Correlations-entre-asthme-declare-et-remboursements-de-medicaments-dans-l-enquete-ESPS-2006> (accessed March 1, 2018).

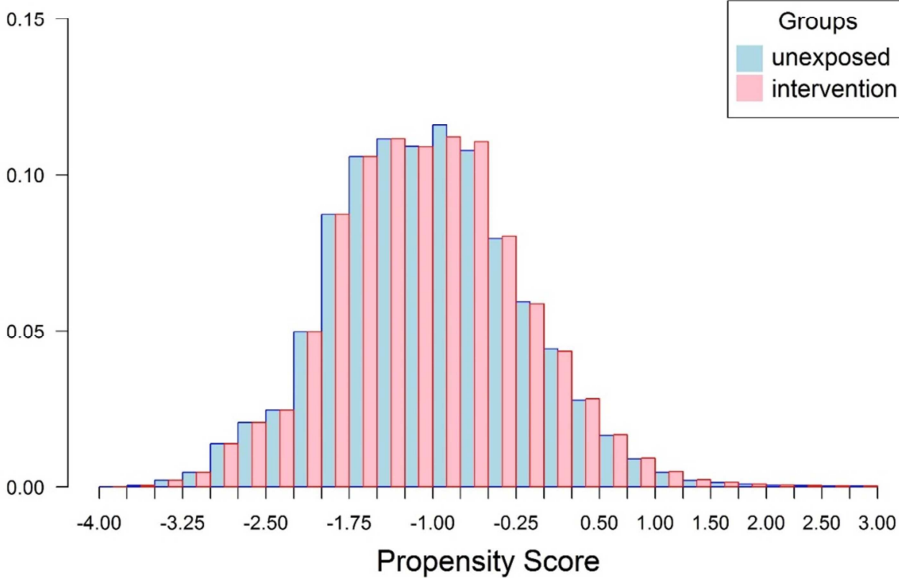
Appendix 3.

Supplemental Figure S1A: Performance of Matching. Histogram of distribution of propensity scores a) before matching and b) after matching.

a)



b)



Supplemental Figure S1B: Graphical representation of standardized differences before and after propensity score matching comparing covariate values.

