SUPPLEMENT

Supplemental Figure 1 – Funnel Plot Incorporating 16 Populations from the 11 Studies Included in the Meta-Analysis
Studies included - Alsheri et al., 2020; Costa et al., 2018; Covar et al., 2008; Emerman et al., 2001; Engelkes et al., 2016; Engelkes et al., 2020; Quezada et al., 2016; Triasih et al., 2011; Turner et al., 2018; van den Bosch et al., 2012; Wu et al., 2011.
| Study Design                  | Author                  | Outcome                                                                 | Positive Predictive Value |
|-------------------------------|-------------------------|-------------------------------------------------------------------------|---------------------------|
| Randomised Controlled Trial   | Covar et al., 2008      | ≥1 prednisone course in prior year + exacerbation during follow-up       | 0.43                      |
|                               | Wu et al., 2011         | ED visit or hospitalisation in year prior to randomisation + exacerbation during follow-up | 0.58                      |
|                               | Quezada et al., 2016    | Unscheduled visit in prior year + future exacerbation                   | 0.77                      |
| Prospective Cohort Study      | Emerman et al., 2001    | Hospitalisation in prior year + future exacerbation                     | 0.31                      |
|                               | Chen et al., 2003       | Hospitalisation + readmission in following year                        | 0.30                      |
|                               | Miller et al., 2008     | ED visit + urgent care visit in following 6 months                      | 0.14                      |
|                               | To et al., 2008         | ED visit + exacerbation in following 6 months                           | 0.54                      |
| Routinely Acquired Data       | Tolomeo et al., 2009    | Hospitalisation + ED visit in following year                           | 0.28                      |
|                               | Kenyon et al., 2014     | Hospitalisation + readmission in following year                        | 0.17                      |
|                               | Engelkes et al., 2016   | Exacerbation in year prior to cohort entry + exacerbation during follow-up | 0.28                      |
|                               | To et al., 2018         | ED visit + ED visit in following year                                  | 0.12                      |
|                               | Turner et al., 2018     | Exacerbation in baseline year + exacerbation in outcome year            | 0.43                      |
|                               | Engelkes et al., 2020   | Exacerbation + future ED visit/hospitalisation                          |                           |
|                               |                         | CPRD                                                                    | 0.15                      |
|                               |                         | SIDIAP                                                                  | 0.13                      |
|                               |                         | IPCI                                                                    | 0.19                      |
|                               |                         | AUH                                                                     | 0.08                      |
|                               |                         | PEDIANET                                                                | 0.06                      |
| Retrospective Case-Control    | van den Bosch et al., 2012 | Hospitalisation + future PICU admission                                 | 0.73                      |
|                               | Visitsunthorn et al., 2013 | Hospitalisation + readmission                                           | 0.26                      |
|                               | Costa et al., 2018      | ≥3 ED visits in prior year + exacerbation at baseline                   | 0.78                      |
|                               | Alsheri et al., 2020    | PICU admission + future PICU admission                                   | 0.25                      |

Abbreviations used: AUH – Aarhus University Prescriptio n Database, CPRD – Clinical Practice Research Datalink, ED – Emergency Departme nt, IPCI – Integrated Primary Care Information, PICU – Paediatric Intensive Care Unit, SIDIAP - Sistema d’Informació per al Desenvolupament de la Investigació en Atenció Primària.

Search Strategy
Ovid MEDLINE(R) – 1946 to December Week 5 2020

1. exp Asthma/
2. asthma$.tw.
3. (asthma$ adj3 attack$).tw.
4. (asthma$ adj3 exacerbation$).tw.
5. (p?ediatric adj3 asthma$).tw.
6. (acute adj3 asthma$).tw.
7. 1 or 2 or 3 or 4 or 5 or 6
8. exp Child/
9. p?ediatric$.tw.
10. 8 or 9
11. (risk adj3 factor$).tw.
12. 7 and 10 and 11

Limits ➔ English language, Human studies, no Review articles, publication year 2000-current

Ovid EMBASE classic + EMBASE – 1947 to 2021 January 08

1. exp Asthma/
2. asthma$.tw.
3. (asthma$ adj3 attack$).tw.
4. (asthma$ adj3 exacerbation$).tw.
5. (p?ediatric adj3 asthma$).tw.
6. (acute adj3 asthma$).tw.
7. 1 or 2 or 3 or 4 or 5 or 6
8. exp Child/
9. p?ediatric$.tw.
10. 8 or 9
11. (risk adj3 factor$).tw.
12. 7 and 10 and 11

Limits ➔ English language, Human studies, no Review articles, publication year 2000-current

APA PsycInfo 1806 to January Week 1 2021

1. exp Asthma/
2. asthma$.tw.
3. (asthma$ adj3 attack$).tw.
4. (asthma$ adj3 exacerbation$).tw.
5. (p?ediatric adj3 asthma$).tw.
6. (acute adj3 asthma$).tw.
7. 1 or 2 or 3 or 4 or 5 or 6
8. child$.tw.
9. p?ediatric$.tw.
10. 8 or 9
11. (risk adj3 factor$).tw.
12. 7 and 10 and 11
Limits → English language, Human studies, no Review articles, publication year 2000-current

**EBSCO CINAHL**

S1. (MH “Asthma+”)
S2. TX asthma*
S3. TX asthma* attack*
S4. TX asthma* exacerbation*
S5. TX p?ediatic asthma*
S6. TX acute asthma*
S7. (MH “Child+”)
S8. TX p?ediatic*
S9. TX risk factor*
S10. S1 or S2 or S3 or S4 or S5 or S6
S11. (S1 or S2 or S3 or S4 or S5 or S6) AND (S7 or S8)
S12. ((S1 or S2 or S3 or S4 or S5 or S6) AND (S7 or S8)) AND (S9)
S13. (((S1 or S2 or S3 or S4 or S5 or S6) AND (S7 or S8)) AND (S9)) NOT PT review article

Limits → English language, publication year 2000-2021

**Rules applied during scoring**
Under the selection bias domain, studies were awarded a rating based on how likely the selected population is to be representative of the target population, and, where applicable, the percentage of selected individuals that agreed to participate.

Under the study design domain, studies were awarded a strong rating if they used data from a randomised controlled trial and a moderate rating if they were a case-control or cohort study.

Under the confounders domain, studies were awarded a strong rating if either there were no important differences between groups, or if they controlled for confounders in their analysis, such as through the use of multivariate models.

Under the data collection methods domain, studies were awarded a strong rating if a database of routinely acquired data was used, or if extra measures were taken to ensure the reliability of the data collected. Studies were awarded a moderate rating if methods such as medical record review or parental interviews were used.

Under the withdrawals and drop-outs domain, studies were awarded a rating based on whether drop-outs were reported in terms of numbers and reasons and also the percentage of individuals completing the study. Retrospective case-control studies were awarded a not applicable status for this domain in accordance with the EPHPP tool guidance.

The global rating was determined based on the number of weak ratings each study had received, with a strong global rating being awarded to studies with no weak domains, a moderate global rating for studies with one weak domain and a weak rating for studies with two or more weak domains.

Results of Quality Assessment
Overall, there was a moderate risk of selection bias across the included studies with 14 awarded a strong rating, 11 awarded a moderate rating and one awarded a weak rating. Chen et al., 2003 received a weak rating because, even though the identified individuals were deemed very likely to be representative of the target population, only 44% of selected individuals agreed to participate, increasing the likelihood that these individuals were not representative of the overall target population. Although the majority of studies were awarded a strong rating for selection bias because the individuals selected were likely to be representative of the target population identified in the study, their results may not necessarily be generalisable to the wider asthma population as they often used children admitted to hospital, or seen in the ED, and these children may represent a more severe subset of the childhood asthma population.

The majority of studies received a moderate rating for study design as they were either cohort or case-control studies, with only four receiving a strong rating as they used data from randomised controlled trials.

All but one of the studies received a strong rating in the confounders domain due to there either being no differences between the groups in the study or use of appropriate statistical analysis, with multivariate models used to control for potential confounders. Quezada et al., 2016 received a weak rating as there was no effort to control for confounding variables either in the methodology or analysis, reducing the validity of the results.

In the data collection methods domain, 16 received a strong rating and 10 received a moderate rating. The latter rating was due to there being a risk of recall bias in these 10 studies due to use of parental and child interviews, or medical record reviews as their means of data collection. There are differences in the way, and the level of detail, that medical professionals document clinical information based on deemed relevance and importance, and therefore medical records are also not a completely reliable source of data. However, due to the retrospective nature of the majority of these studies, these data collection methods were the only ones available.

Within the withdrawals and drop-out domains, six studies had a retrospective case-control design and therefore received a not applicable rating. Of the remaining 20 studies, 12 received a strong rating and seven received a moderate rating. There was a risk of attrition bias in these seven studies due to not reporting withdrawals and drop-outs in terms of both numbers and reasons. However, for all of these studies, greater than 80% of participants completed the study. Haselkorn et al., 2009
received a weak rating due to its use of data from the TENOR study which did not report information regarding drop-outs or the percentage of participants completing the study.