NHS
Birmingham Women's and Children's
NHS Foundation Trust

Year in Respiratory Medicine- Summary of Key Papers

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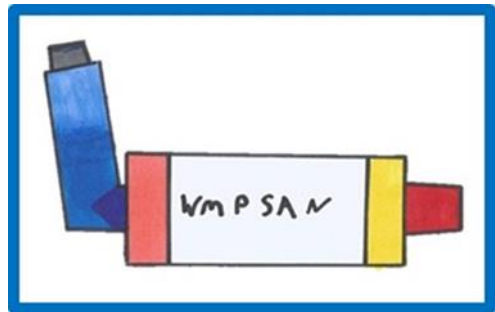
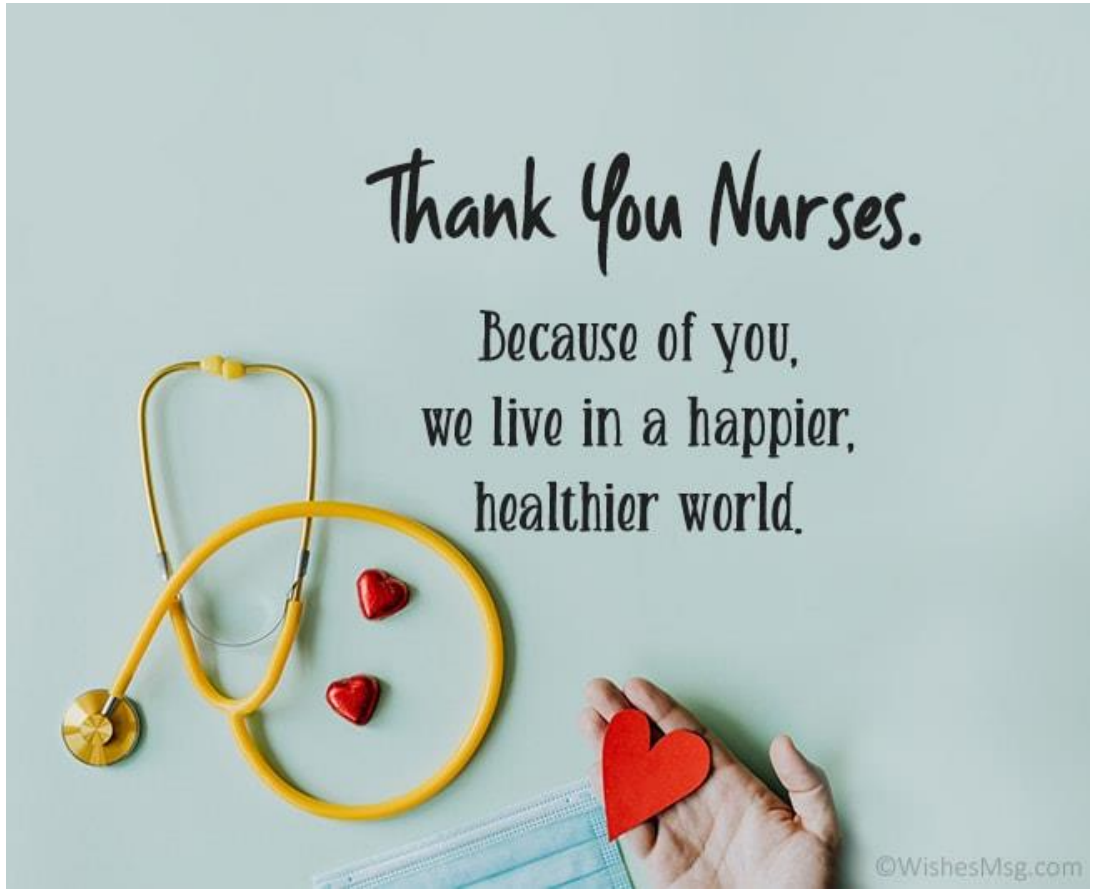
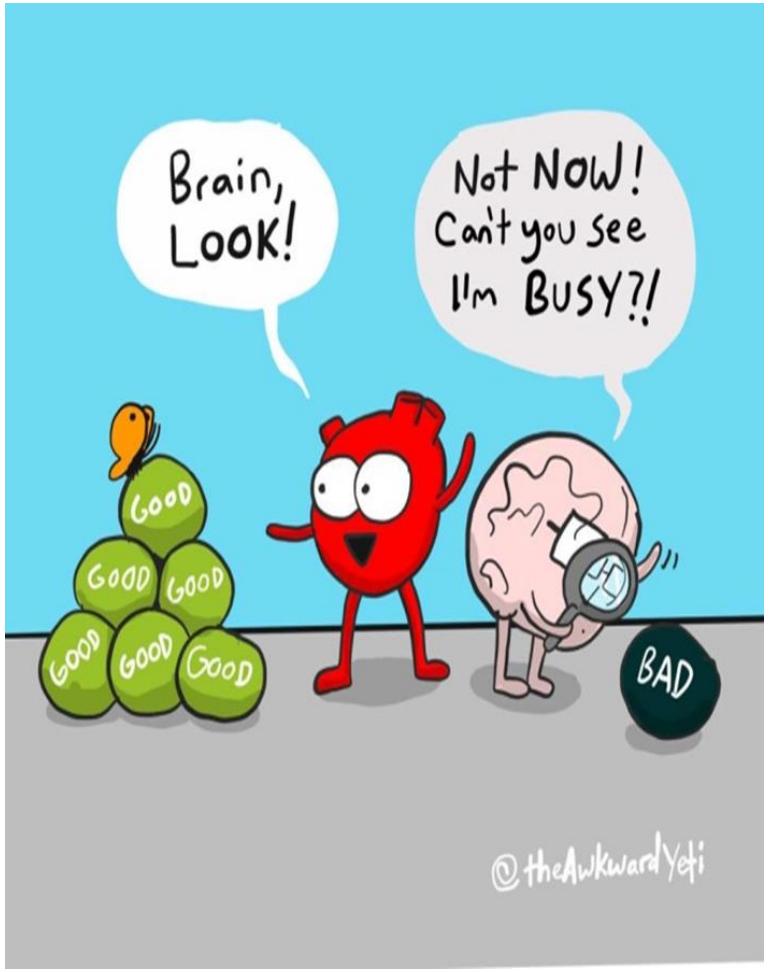
INSTITUTE OF INFLAMMATION AND AGEING



You are ‘Awesome’






WORLD
WORLD
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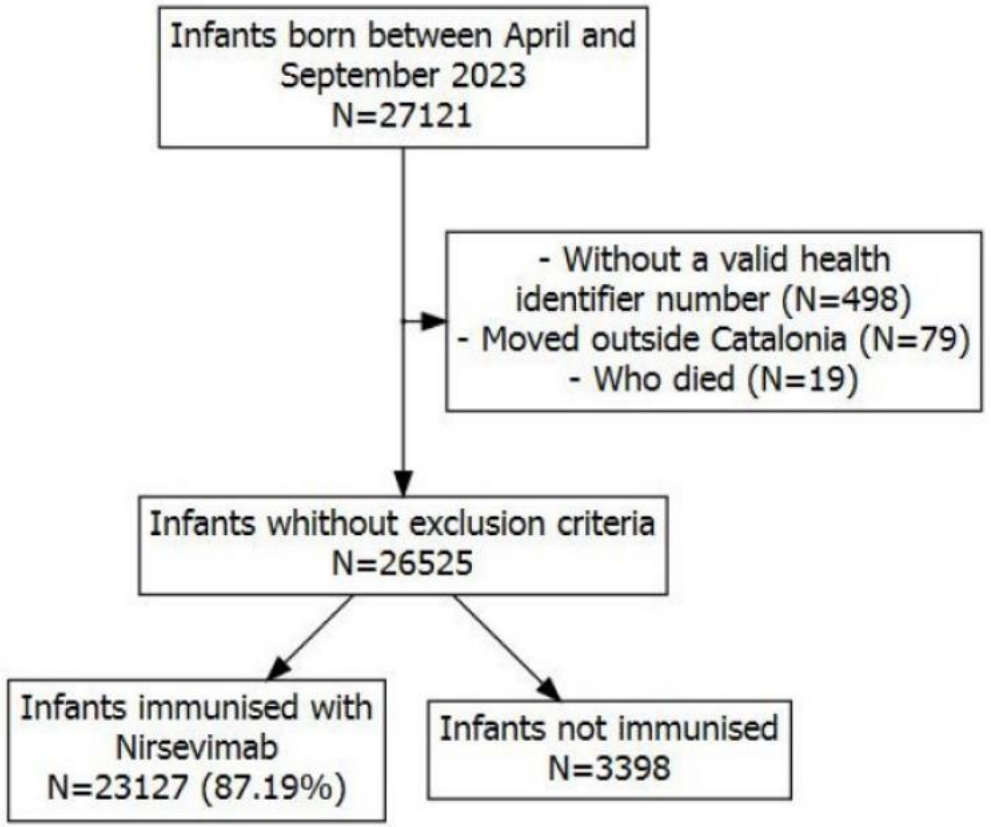
WORLD
2024

RSV immunisation

OPEN ACCESS

Effectiveness of nirsevimab immunoprophylaxis against respiratory syncytial virus-related outcomes in hospital and primary care settings: a retrospective cohort study in infants in Catalonia (Spain)



- 87.6% reduction in hospital admissions
- 90.1% reduction in intensive care unit admissions

reductions in

- primary care diagnosed bronchiolitis (48.1%)
- RSV infections (68.9%)
- viral pneumonia (60.7%)
- hospital emergency visits for bronchiolitis (55.4%)

Como:ADC:2024

Effectiveness and impact of universal prophylaxis with nirsevimab in infants against hospitalisation for respiratory syncytial virus in Galicia, Spain: initial results of a population-based longitudinal study

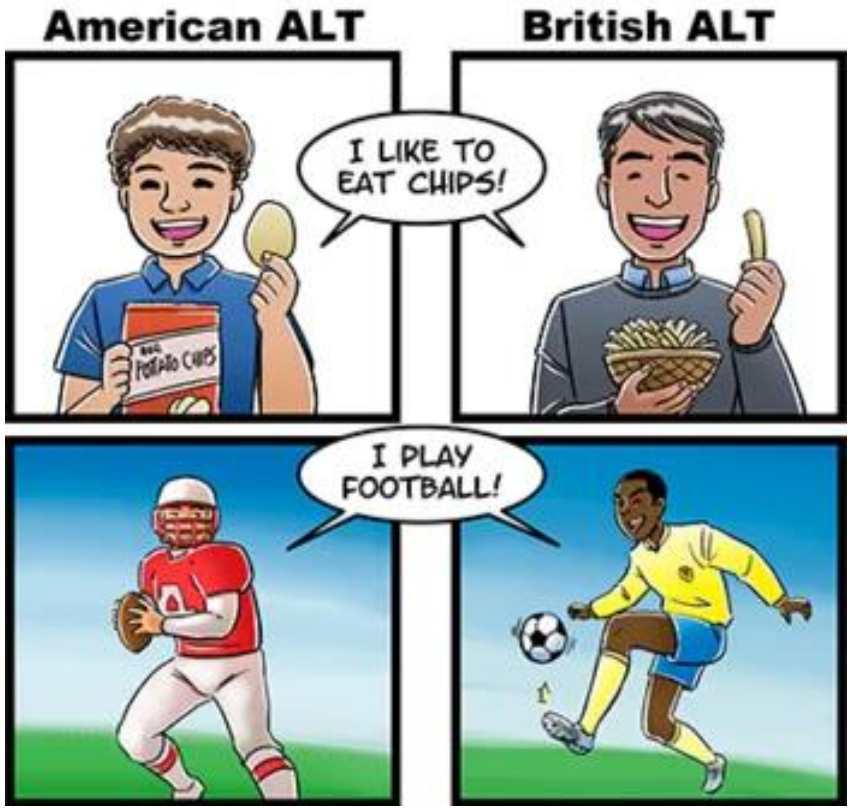
1. **Effectiveness of Nirsevimab**: The effectiveness of nirsevimab in preventing RSV-related LRTI hospitalisations was 82.0%
2. **Severe RSV-related LRTI**: Effectiveness against severe RSV-related LRTI requiring oxygen support was 86.9%2.
3. **All-cause LRTI Hospitalisations**: There was a 69.2% effectiveness against all-cause LRTI hospitalisations2.
4. **All-cause Hospitalisations**: The effectiveness against all-cause hospitalisations was 66.2%

Gomez: Lancet:2024

RSV immunisation ‘game changer’

- Reduced RSV Hospitalizations: young infants, high risk infants
- Lowered Mortality Rates: in infants < 6 months of age
- Decreased Healthcare Costs
- Enhanced Herd Immunity
- ? Reduction in all cause hospitalizations
- Number needed to treat: 11-63
- ?UK roll out
- Mind the gap: vaccine access to low middle income countries
- Long term effects: impact on asthma epidemiology, lung /airway growth

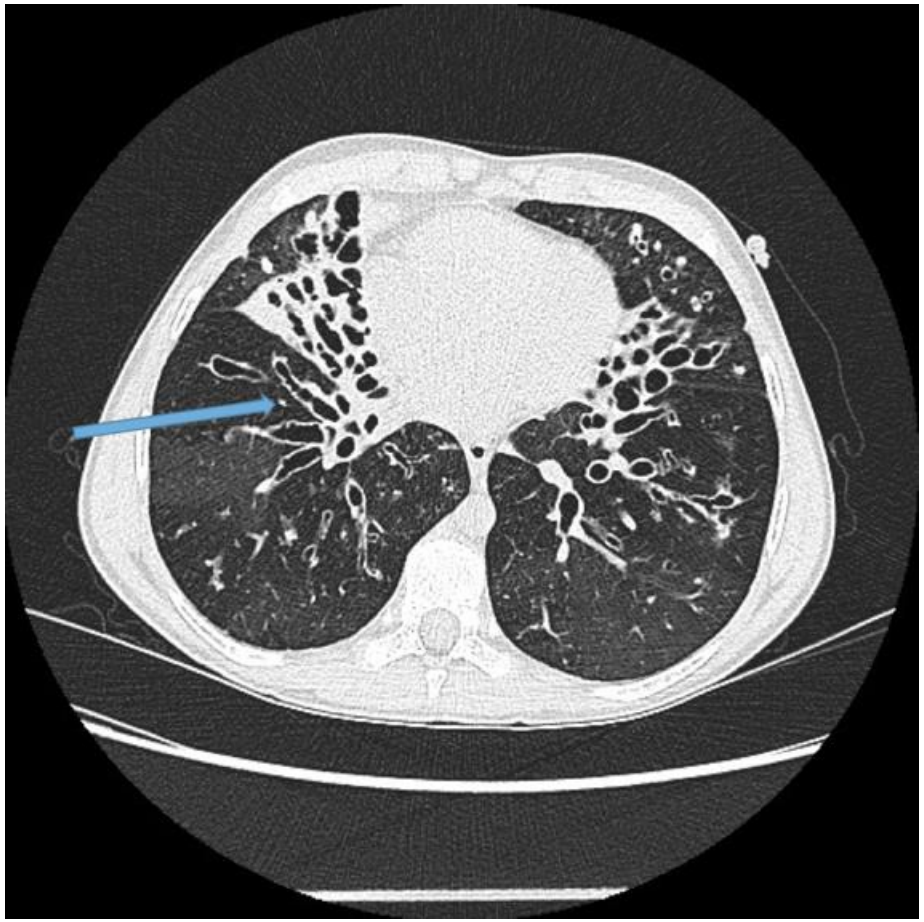
The great Irish author Oscar Wilde memorably remarked that "We have really everything in common with America nowadays except, of course, language,"

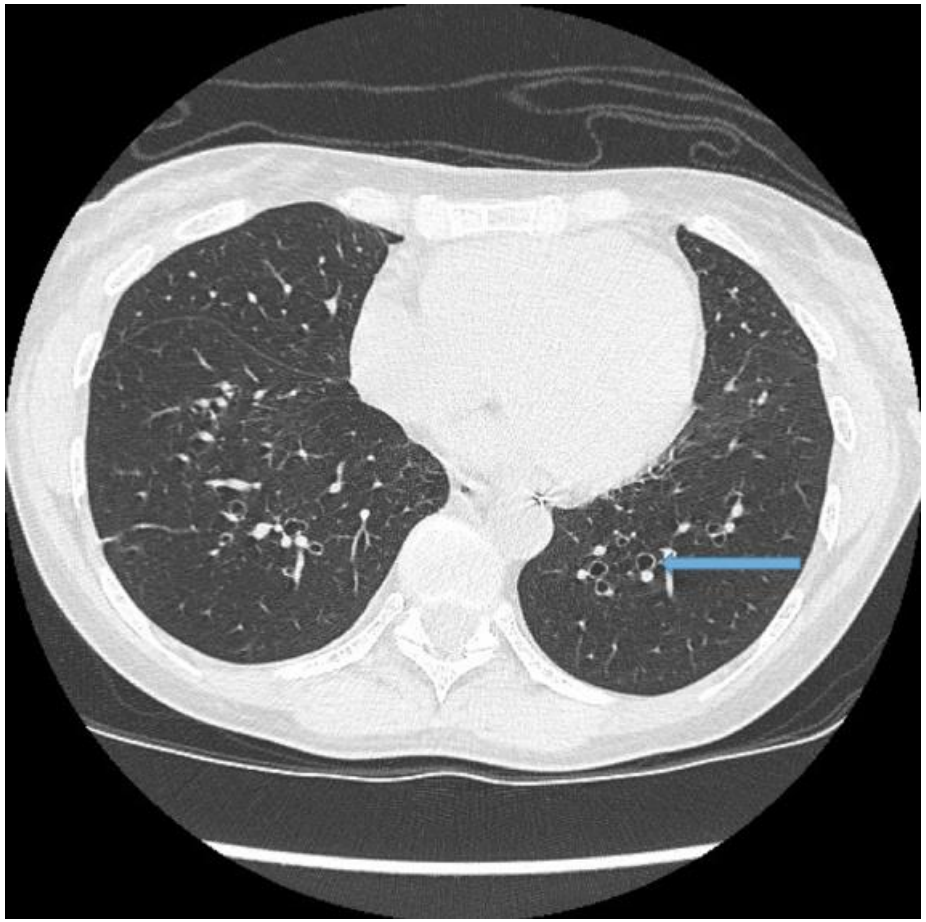


Andy Bush: AJRCCM:2024

Bronchiectasis

Is Bronchiectasis reversible?





ORIGINAL ARTICLE

Radiographic Outcomes in Pediatric Bronchiectasis and Factors Associated with Reversibility

Dustin R. Mills[1,3,4], Ian B. Masters[1,5], Stephanie T. Yerkovich[5,6], Jane McEniery[2,3], Nitin Kapur[1,3], Anne B. Chang[1,5,6], Julie M. Marchant[1,5*], and Vikas Goyal[1,5,7*]

- A study reported the largest follow-up series of CT scans in children with non-CF bronchiectasis, analysing 142 children with paired scans.
- Complete radiographic resolution was observed in 40.1% of children, improvement in 39.4%, while 20.4% showed no change or worsened.
- Younger age at diagnosis and a lower modified Reiff score significantly increased the likelihood of radiographic resolution.

Mills: AJRCCM:2024

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- Pseudomonas aeruginosa infection was consistently associated with persistent airway dilatation.
- Early and intensive treatment appears to improve chances of airway dilatation resolution in children with bronchiectasis.
- Selection bias may exist, as only 19% of the initial cohort underwent rescanning, with unclear criteria for choosing these patients for follow-up scans.

Conference Abstract Free

Non-cystic fibrosis, non-primary ciliary dyskinesia bronchiectasis (nCFnPCD-BE) in preschool children

K Jehanzeb | C Hine | H Smith | N Parsons | M Desai | P Kenia | P Nagakumar See Less

n=15

13 had repeat CT 6 yr later

10/13 (77%) had improved

3/13 children with neurological or multisystem conditions had worsening bronchiectasis

ERS:2022

BMJ Open. 2024 Jul 31;14(7):e078994. doi: 10.1136/bmjopen-2023-078994.

Experiences of children with bronchiectasis and their parents in a novel play-based therapeutic exercise programme: a qualitative analysis

- The study aimed to understand experiences of children with bronchiectasis and their parents in an 8-week play-based exercise program.
- Semi structured individual interviews were conducted with participants.
- Participants included 10 children (aged 5-12) with bronchiectasis and their parents.
- Children enjoyed the program primarily for fun and socializing with friends.

Jones:BMJOpen:2024

- Children enjoyed the program primarily for fun and socializing with friends.
- Parents valued community-based sessions as engaging and motivating.
- Parents observed improvements in their children’s endurance, coordination, and activity levels.
- Time constraints were a challenge for implementing the home exercise program.
- Both parents and children preferred in-person sessions over online exercise delivery.

Pediatric physiotherapy management of airway clearance therapy and exercise: Data from the Australian Bronchiectasis Registry

- The study analyzed the use of airway clearance techniques (ACTs) and exercise among 397 Australian children with bronchiectasis.
- Only 30% of children engaged in regular ACTs, while 48% participated in regular physical exercise.
- Physical exercise was the most common ACT modality, practiced by 20% of the children.
- Children with Pseudomonas aeruginosa in sputum had a higher likelihood of performing regular ACTs (OR = 3.88).

Webb:Paediatric pulmunology:2024

- Each hospitalization due to respiratory exacerbation in the past year increased ACT use likelihood by 50%.
- Older age was associated with a higher likelihood of both engaging in exercise (OR = 1.21) and using an ACT device.
- Children with at least one hospitalization in the previous year were less likely to engage in regular exercise (OR = 0.76).
- Age, hospitalization frequency, and disease extent are key predictors for regular ACT and exercise participation.
- Recognizing these predictors may help clinicians customize ACT and exercise prescriptions for children with bronchiectasis.

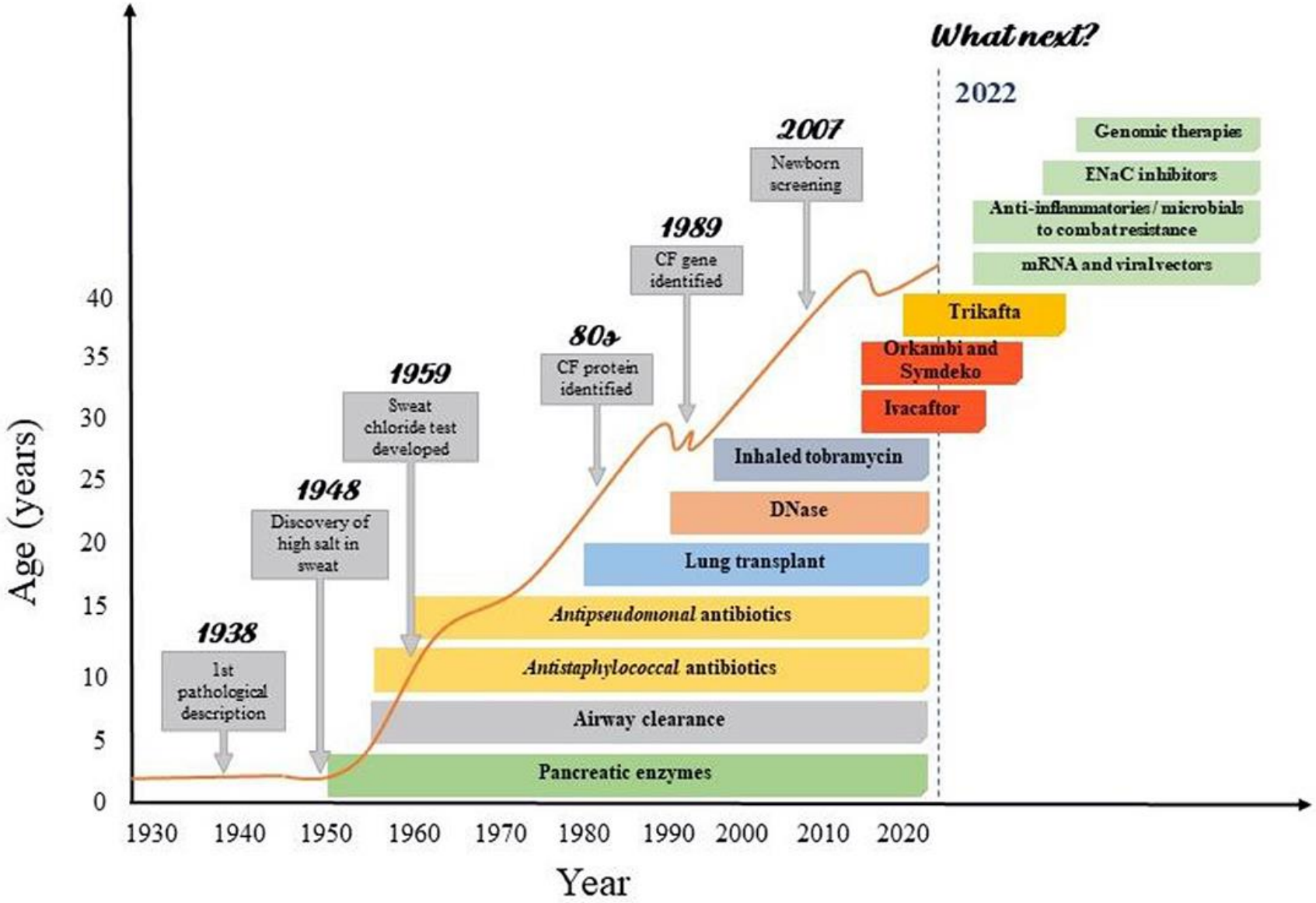
Pediatric Bronchiectasis: Priorities, Precision Medicine, and Transition to Adult Care

- **Research priorities** include preventive strategies, early diagnosis, treatment optimization, and exploration of bronchiectasis phenotypes and endotypes in children.
- The field is advancing slowly compared to adult bronchiectasis, with a need for **multiomics** and other novel techniques for precision medicine.
- There is a lack of **pediatric-specific quality-of-life** and economic evaluation tools for bronchiectasis, which are increasingly needed in today's healthcare landscape.
- Few **randomized controlled trials** provide high-quality evidence for pediatric bronchiectasis treatments, and there are currently no licensed therapeutics specific to this condition.

Merchant:AJRCCM:2024

- **Transition programs** from pediatric to adult care for bronchiectasis are inadequate, leading to poor outcomes in young adults who often lack continuous care.
- Pediatric bronchiectasis can be **reversible** with early diagnosis and effective treatment, highlighting the importance of early intervention in children with chronic wet cough.
- **Primary prevention strategies**, including addressing social inequities and early-life respiratory infections, are essential to reduce the future burden of bronchiectasis globally.

Cystic fibrosis : Improved Survival with Treatment Innovation



Maya Desai

Why standards of care are needed

- All people with CF in the UK should have equal access to the highest level of MDT specialist care that is adequately resourced and encompasses the latest evidence-based therapies

- The aim is to improve quality of life and extend life expectancy

- The standards can be used for benchmarking and outline objective measures of service provision to inform commissioning of CF services

- It is hoped that these standards will also act as an aid for CF Centres undertaking Quality Improvement programmes

Maya Desai

Asthma

Review

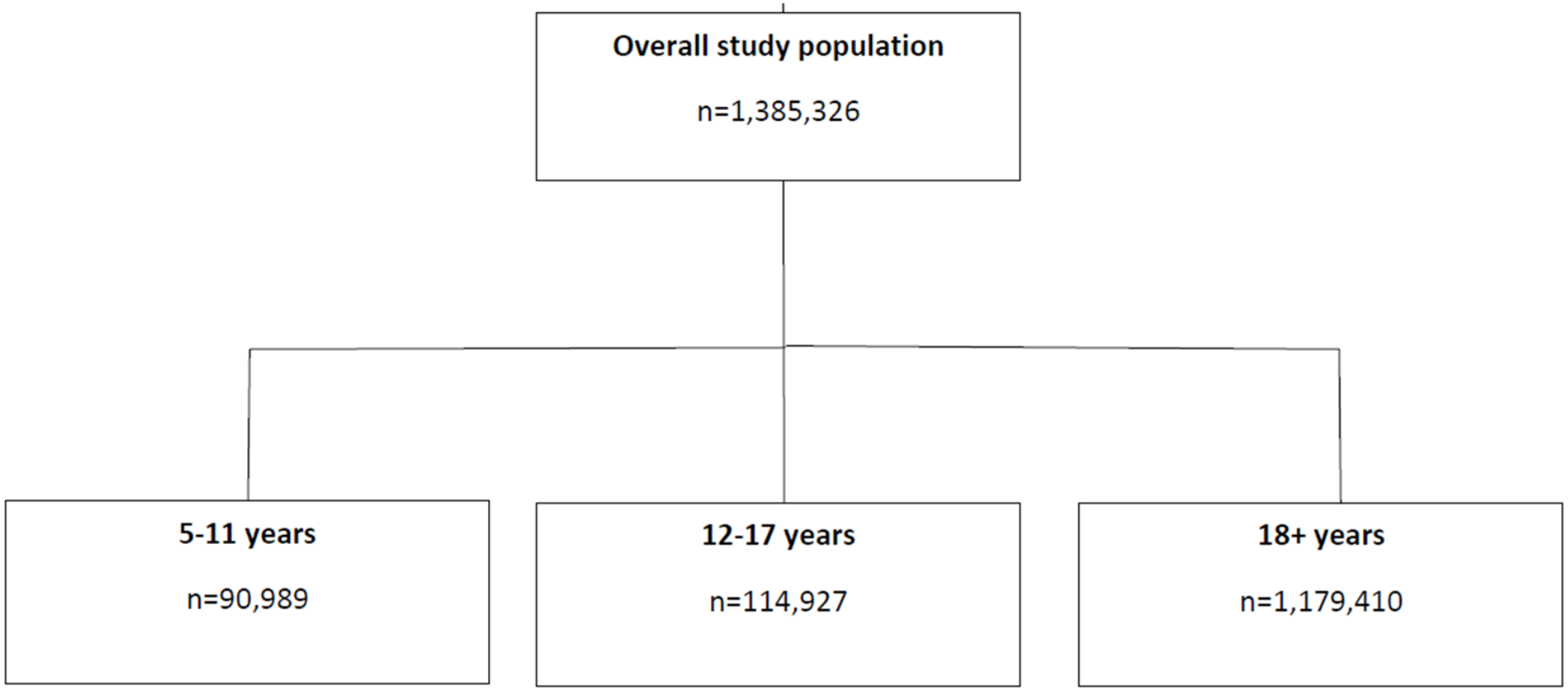
Addition of long-acting beta-agonists to inhaled corticosteroids for asthma in preschool children: A systematic review

- **Heterogeneous Global Guidelines on LABA + ICS for Preschool Asthma Management**
- **Efficacy of LABA + ICS in Reducing Asthma Exacerbations in Preschoolers**
  six studies (n = 1415) found that LABA (specifically salmeterol) combined with ICS significantly reduced asthma exacerbations,
- **Mixed Results in Night-time Symptom Control and Lung Function Improvement**
- **Favourable Safety Profile of LABA + ICS Therapy in Preschool Asthma**

Ambrozej:PRR:2024

Risk factors for asthma-related hospital and intensive care admissions in children, adolescents and adults: a cohort study using primary and secondary care data

Author affiliations • Nikita Simms-Williams [1], Prasad Nagakumar [2 3], Rasiah Thayakaran [1], Nicola J Adderley [1], Richard Hotham [1], Adel H Mansur [4 5], Krishnarajah Nirantharakumar [1], Shamil Haroon [1]. Hide authors



BMJ resp open:2024

Clinical Practice Research Datalink (CPRD)

- UK primary care records were extracted from the (CPRD Aurum) with linked Hospital Episode Statistics (HES) Admitted Patient care (APC) for the recruitment period from 1st January 2017 to 31st December 2019
- CPRD Aurum has over 2 million registered patients with a diagnosis asthma, providing ample statistical power for both the analyses
- The study did not analyse emergency department attendances due to the unavailability of linked emergency department data
- Asthma is often both underdiagnosed and misdiagnosed in routine clinical care, which risks introducing misclassification bias in our analyses

Likelihood of asthma-related hospital admission highest in children and lowest adults

Risk factors for asthma-related hospital admissions for 5-11 years include:

Demographics:-

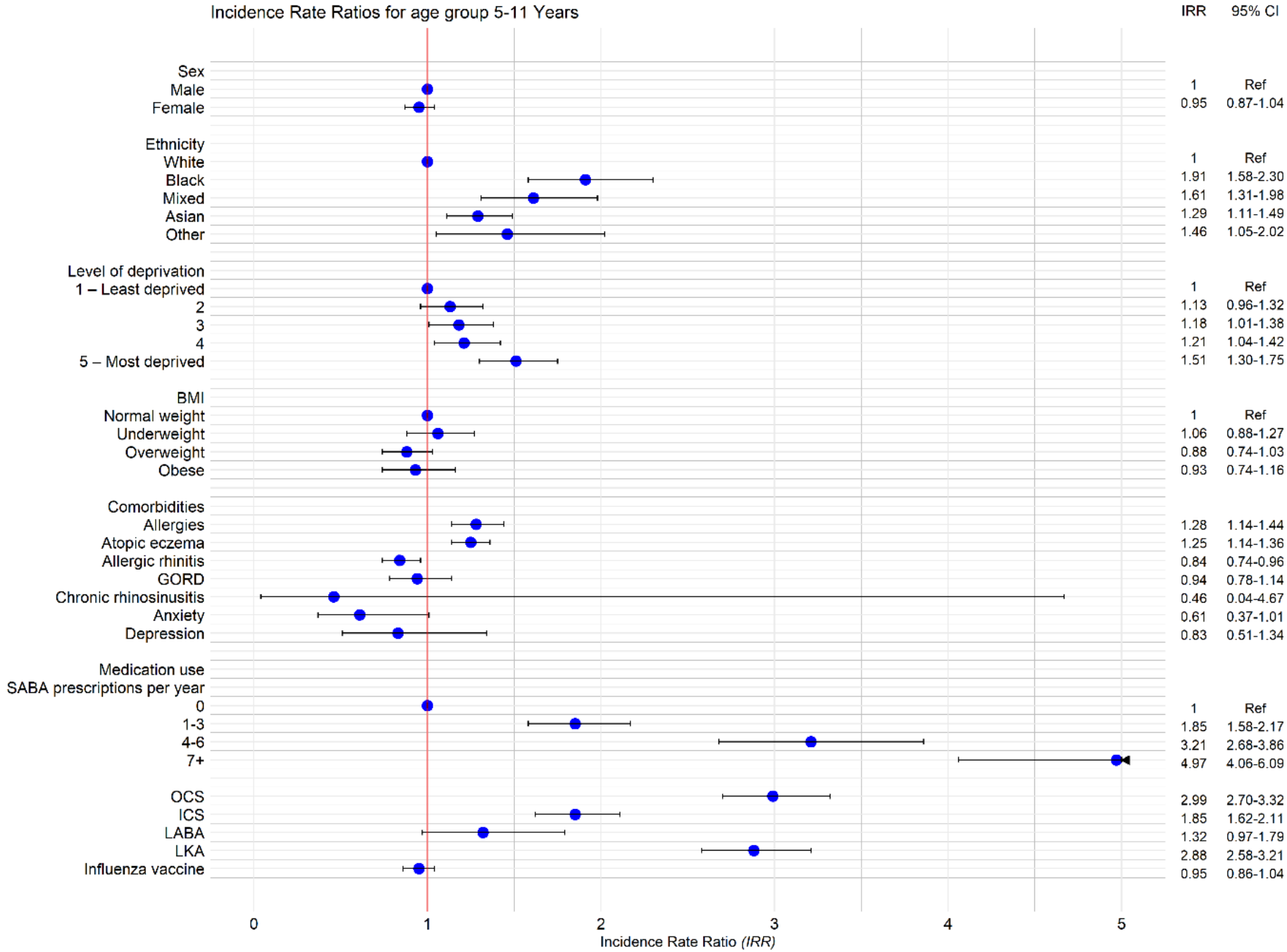
- *Ethnicity*
  - Black
  - Mixed
  - Asian
  - Other
- *Deprivation*

Medications:-

- *Salbutamol inhaler*
- *Oral and inhaled corticosteroids*
- *Leukotriene receptor antagonists*

Co-existing diseases/conditions :-

- *Allergies*
- *Eczema*


Incidence Rate Ratios for age group 5-11 Years
IRR
95% CI
Sex
Male 1 Ref
Female 0.95 0.87-1.04
Ethnicity
White 1 Ref
Black 1.91 1.58-2.30
Mixed 1.61 1.31-1.98
Asian 1.29 1.11-1.49
Other 1.46 1.05-2.02
Level of deprivation
1 – Least deprived 1 Ref
2 1.13 0.96-1.32
3 1.18 1.01-1.38
4 1.21 1.04-1.42
5 – Most deprived 1.51 1.30-1.75
BMI
Normal weight 1 Ref
Underweight 1.06 0.88-1.27
Overweight 0.88 0.74-1.03
Obese 0.93 0.74-1.16
Comorbidities
Allergies 1.28 1.14-1.44
Atopic eczema 1.25 1.14-1.36
Allergic rhinitis 0.84 0.74-0.96
GORD 0.94 0.78-1.14
Chronic rhinosinusitis 0.46 0.04-4.67
Anxiety 0.61 0.37-1.01
Depression 0.83 0.51-1.34
Medication use
SABA prescriptions per year
0 1 Ref
1-3 1.85 1.58-2.17
4-6 3.21 2.68-3.86
7+ 4.97 4.06-6.09
OCS 2.99 2.70-3.32
ICS 1.85 1.62-2.11
LABA 1.32 0.97-1.79
LKA 2.88 2.58-3.21
Influenza vaccine 0.95 0.86-1.04
0
1
2
3
4
5
Incidence Rate Ratio (IRR)

Results

Risk factors for asthma-related hospital admissions for 12-17 years include:

Demographics:-

- *Ethnicity*
  - Black
  - Asian
  - Mixed
  - Other
- *Female sex*
- *Deprivation*
- *Smoking*

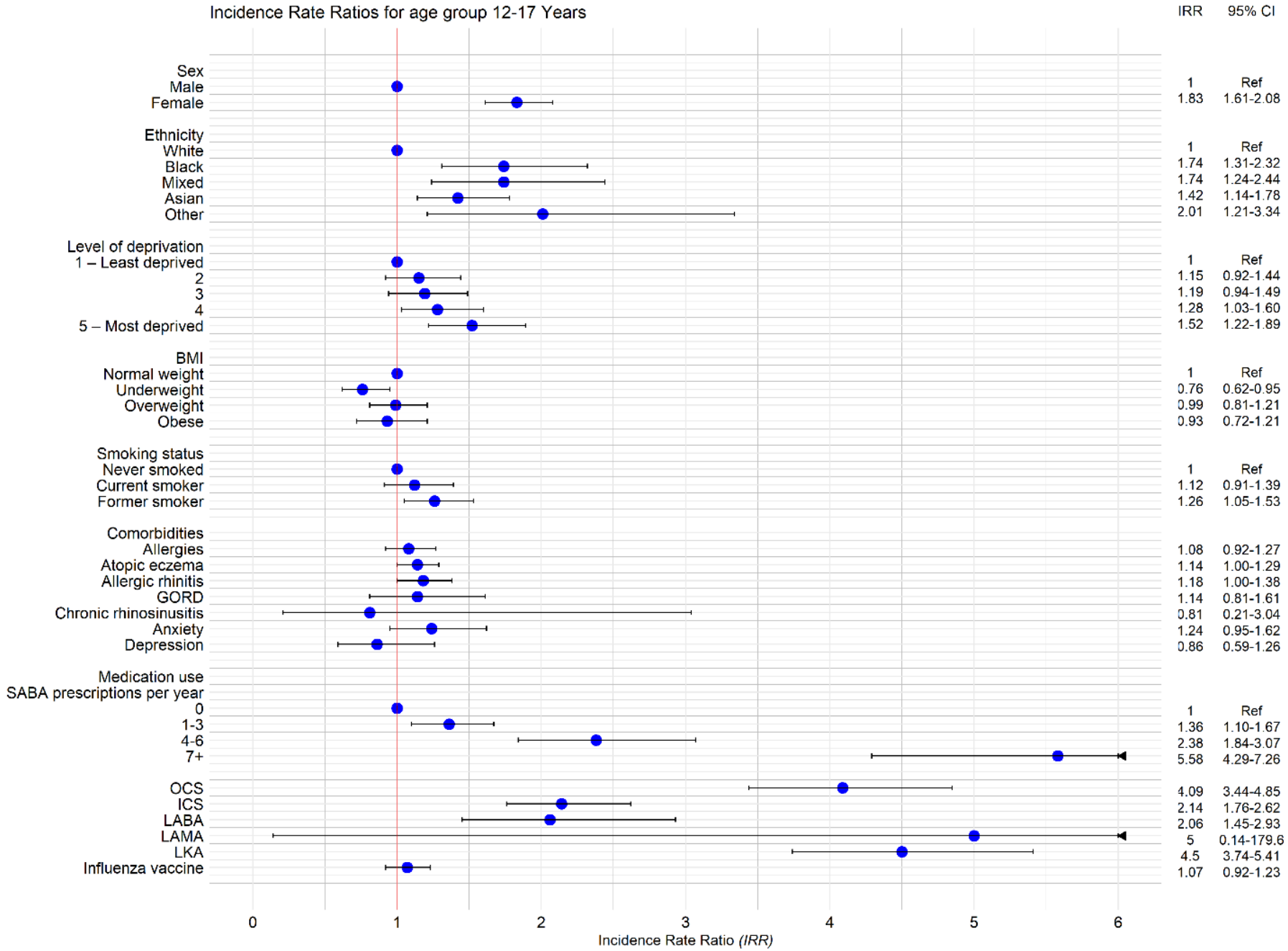
Medications:-

- *Salbutamol*
- *Oral and inhaled corticosteroids*
- *Other asthma medications*

Co-existing diseases/conditions:

-

- *Allergic rhinitis*


Incidence Rate Ratios for age group 12-17 Years
IRR
95% CI
Sex
Male
1
Ref
Female
1.83
1.61-2.08
Ethnicity
White
1
Ref
Black
1.74
1.31-2.32
Mixed
1.74
1.24-2.44
Asian
1.42
1.14-1.78
Other
2.01
1.21-3.34
Level of deprivation
1 – Least deprived
1
Ref
2
1.15
0.92-1.44
3
1.19
0.94-1.49
4
1.28
1.03-1.60
5 – Most deprived
1.52
1.22-1.89
BMI
Normal weight
1
Ref
Underweight
0.76
0.62-0.95
Overweight
0.99
0.81-1.21
Obese
0.93
0.72-1.21
Smoking status
Never smoked
1
Ref
Current smoker
1.12
0.91-1.39
Former smoker
1.26
1.05-1.53
Comorbidities
Allergies
1.08
0.92-1.27
Atopic eczema
1.14
1.00-1.29
Allergic rhinitis
1.18
1.00-1.38
GORD
1.14
0.81-1.61
Chronic rhinosinusitis
0.81
0.21-3.04
Anxiety
1.24
0.95-1.62
Depression
0.86
0.59-1.26
Medication use
SABA prescriptions per year
0
1
Ref
1-3
1.36
1.10-1.67
4-6
2.38
1.84-3.07
7+
5.58
4.29-7.26
OCS
4.09
3.44-4.85
ICS
2.14
1.76-2.62
LABA
2.06
1.45-2.93
LAMA
5
0.14-179.6
LKA
4.5
3.74-5.41
Influenza vaccine
1.07
0.92-1.23
0
1
2
3
4
5
6
Incidence Rate Ratio (IRR)

Results

Risk factors for asthma-related hospital admissions for 18+ years include:

Demographics:-

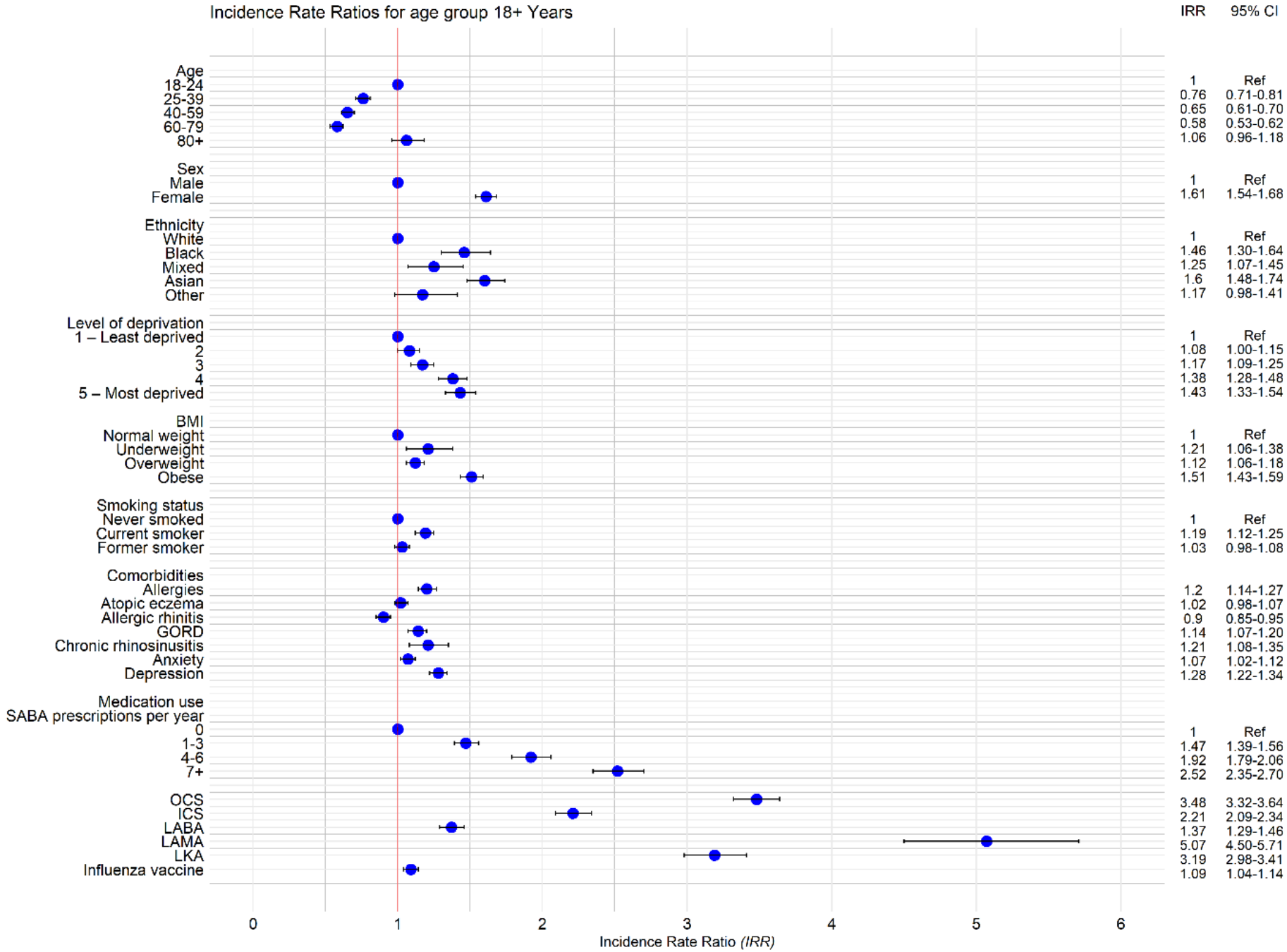
- *Age*
- *Ethnicity*
  - Black
  - Mixed
  - Asian
- *Female sex*
- *Deprivation*
- *Overweight*
- *obesity*
- *Smoking*

Medications:-

- *Preventer inhalers (SABAs)*
- *Oral and inhaled corticosteroids*
- *Other asthma medications*
- *Flu vaccine*

Comorbidities:-

- *Allergies*
- *Gastro-oesophageal reflux disease*
- *Sinusitis*
- *Anxiety*
- *Depression*


Incidence Rate Ratios for age group 18+ Years
IRR
95% CI
Age
18-24
25-39
40-59
60-79
80+
1 Ref
0.76 0.71-0.81
0.65 0.61-0.70
0.58 0.53-0.62
1.06 0.96-1.18
Sex
Male
Female
1 Ref
1.61 1.54-1.68
Ethnicity
White
Black
Mixed
Asian
Other
1 Ref
1.46 1.30-1.64
1.25 1.07-1.45
1.6 1.48-1.74
1.17 0.98-1.41
Level of deprivation
1 – Least deprived
2
3
4
5 – Most deprived
1 Ref
1.08 1.00-1.15
1.17 1.09-1.25
1.38 1.28-1.48
1.43 1.33-1.54
BMI
Normal weight
Underweight
Overweight
Obese
1 Ref
1.21 1.06-1.38
1.12 1.06-1.18
1.51 1.43-1.59
Smoking status
Never smoked
Current smoker
Former smoker
1 Ref
1.19 1.12-1.25
1.03 0.98-1.08
Comorbidities
Allergies
Atopic eczema
Allergic rhinitis
GORD
Chronic rhinosinusitis
Anxiety
Depression
1.2 1.14-1.27
1.02 0.98-1.07
0.9 0.85-0.95
1.14 1.07-1.20
1.21 1.08-1.35
1.07 1.02-1.12
1.28 1.22-1.34
Medication use
SABA prescriptions per year
0
1-3
4-6
7+
1 Ref
1.47 1.39-1.56
1.92 1.79-2.06
2.52 2.35-2.70
OCS
ICS
LABA
LAMA
LKA
Influenza vaccine
3.48 3.32-3.64
2.21 2.09-2.34
1.37 1.29-1.46
5.07 4.50-5.71
3.19 2.98-3.41
1.09 1.04-1.14
0
1
2
3
4
5
6
Incidence Rate Ratio (IRR)

Effectiveness of paediatric asthma hubs: a clinical pilot study

- **High appointment attendance among referred CYP**

85.3% of 312 referred children and young people (CYP) attended their appointments

- **Rapid referral to review time**

Median time from referral to review was only 2 days (IQR 1–3)

- **Small proportion requiring hospital treatment**

1.1% of CYP were severely unwell at review and needed further hospital treatment.

- **Asthma confirmed in nearly one-third of tested CYP**

Asthma was confirmed in 31.6% of CYP based on NICE criteria.

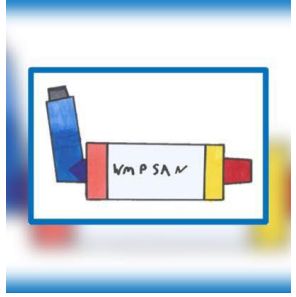
Hakizimana:ADC:2024

Median Index of Multiple Deprivation Decile (IQR)	4 (2–8)
Clinical assessment of children attending the hub (n=266)	
In respiratory distress at the time of appointment, n (%)	22 (8.3)
Audible wheeze, n (%)	13 (4.9)
Median baseline O_2 (IQR)	97% (96–98)
Median number of attacks ever (IQR)	4 (2–10)
Median number of attacks in the past year (IQR)	1 (1–3)
Median number of OCS in the past year (IQR)	1 (0–1.75)
Median number of A&E visits ever (IQR)	2 (1–4)
Median number of A&E visits in the past year (IQR)	1 (1–2)
Median (C)ACT score	16 (13–20)
Baseline lung function results	
Median FeNO in ppb (IQR) (n=125)	20 (11–44)
Mean baseline FEV_1 predicted (%) (SD) (n=241)	86.7 (15.4)
Mean baseline FEV_1 z-score (SD)	–0.8 (1.3)
Mean baseline FVC predicted (%) (SD)	91.3 (16.0)
Mean baseline FVC z-score (SD)	–0.5 (1.4)
Mean baseline FEV_1/FVC (%) (SD)	84.6 (8.8)
Mean baseline FEV_1/FVC z-score (SD)	–0.5 (1.3)
Abnormal FEV_1 n (%)	66 (27.4)
Abnormal FEV_1/FVC n (%)	58 (24.0)
Abnormal FEV_1 and FEV_1/FVC n (%)	26 (10.8)

Spirometry, FeNO

- Usable spirometry data were obtained from 241 out of 266
- (90.6%) CYP. Of the 241 CYP with acceptable spirometry,
- **66 (27.3%) had abnormal baseline spirometry**
- 40 (60%) had low FEV1 only,
- 58 (87.9%) had low FEV1/FVC
- 26 (39.4%) had low FEV1 and FEV1/FVC.

- **125 /266 (46.9%) achieved acceptable spirometry**
- **45 of 155 children aged 4–8 years (29.0%)**
- 80 of 111 CYP aged 9–17 years (72.1%).
- The median FeNO was 20 ppb (IQR 11–44 ppb)
- 50 (40%) had a FeNO measurement ≥25 ppb
- **37 CYP (29.6%), FeNO was ≥35 ppb**



‘Dear Colleague, please perform Spirometry/FeNO tests to confirm the diagnosis of asthma..’

Dr Aanchal Khemani, Fellow Respiratory, BCH

Dr Prasad Nagakumar, Consultant Respiratory, BCH

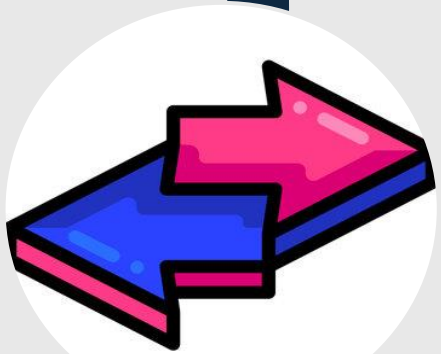
On behalf of the West Midlands Paediatric severe Asthma network

RCPCH: 2024

Project Methods

5-16 years

7 hospitals



Prospective / Retrospective

Sep 22 – Sep 23

FEV_1 / FVC >70 - Normal	**91/97 (94.8%)**
FeNO < 35 - Normal	**36/56 (64.28%)**

- 73% were prescribed ICS at referral
- 52% had medication change despite normal Spirometry/FeNO due to uncontrolled symptoms

‘Asthma’

Heterogenous disease

Symptoms vary over time

Episodic symptoms

Variable airflow limitation

‘Diagnostic tests’

- Best test not known
- Single measurement
- Best timing not known
- Best Cutoffs not known

Implementation and effectiveness of guideline-recommended clinical activities for children with asthma: population-based cohort

Z Khalaf[1], S Saglani[1], CI Bloom[1]

- CPRD data
- 126,000 children
- 2004- 2021

(Chest: 2024)

- **Low Completion of All Recommended Asthma Care Activities**
Only 8% received all three recommended asthma care activities together.

- **Age, Socioeconomic Status, and BMI Influence Care Gaps**
Younger age, deprivation, and higher or unmeasured BMI

- **Asthma Management Plans and Reviews Reduce Exacerbations**
Having an asthma management plan or review reduced exacerbations by about 15% over 12 months.

- **Inhaler Technique Checks Alone Showed No Impact on Exacerbations**
Standalone inhaler technique checks did not correlate with reductions in exacerbations.

- **Combined Asthma Care Activities Significantly Decrease Exacerbation Risk**
Receiving all three activities together was associated with a 30% reduction in exacerbations over 12 months.

Research

Post-hospitalisation asthma management in primary care:
a retrospective cohort study

Dhanusha Punyadasa, Nikita Simms-Williams, Nicola J Adderley, Rasiah Thayakaran, Adel H Mansur, Krishnarajah Nirantharakumar, Prasad Nagakumar and Shamil Haroon

Data: Clinical practice research datalink (CPRD)
Time: 2017- 2019
N=1> 7,000

BJGP:2024

- **High Primary Outcome Achievement Post-Discharge**

60.2% of the 17,457 patients received the primary outcome within 28 days of hospital discharge.

- **Low Rates of Asthma-Specific Follow-Up Activities**

Only 13.2% had an asthma review,
8.4% received an asthma management plan,
8.6% had inhaler technique demonstrated,

- **Majority Received Asthma Medication**

57.3% of discharged patients received an asthma medication.

- **Care Gaps Noted Among Black Ethnic Minority Groups**
Patients from Black ethnic minority backgrounds had 27%–54% lower odds of receiving asthma care activities.

- **Short-Acting Bronchodilator Use Increased Follow-Up Likelihood**
Previous year bronchodilator prescriptions were associated with higher chances of receiving post-discharge follow-up.

- **Need for Improved Post-Discharge Follow-Up**
A substantial number of patients lack timely follow-up in primary care post-discharge, with disparities notably affecting Black ethnic minority groups.

Louise Fleming @Louise_jFleming · Nov 11

Great to see paediatric research promoted by @guardian @guardianscience but please please can media outlets stop using pictures of a child using a salbutamol MDI straight into their mouth #rightasthmaimage

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Asthma.....

- Challenges in diagnostics
- Risk stratification
- Focus on essential asthma care
- Watch out for the NICE/SIGN/BTS guideline
- MART/AIR……..

‘Asthma outcomes are influenced not only by medical care but also by social and environmental factors.

By improving both indoor and outdoor air quality, and addressing deprivation, we can improve asthma control and the quality of life for children with asthma, while also improving the overall health and well-being of their entire families’