

### Mission Statement

To improve prescription of inhaled corticosteroids in asthma patients discharged from Emergency Department from 79.3% to 100% over 6 months

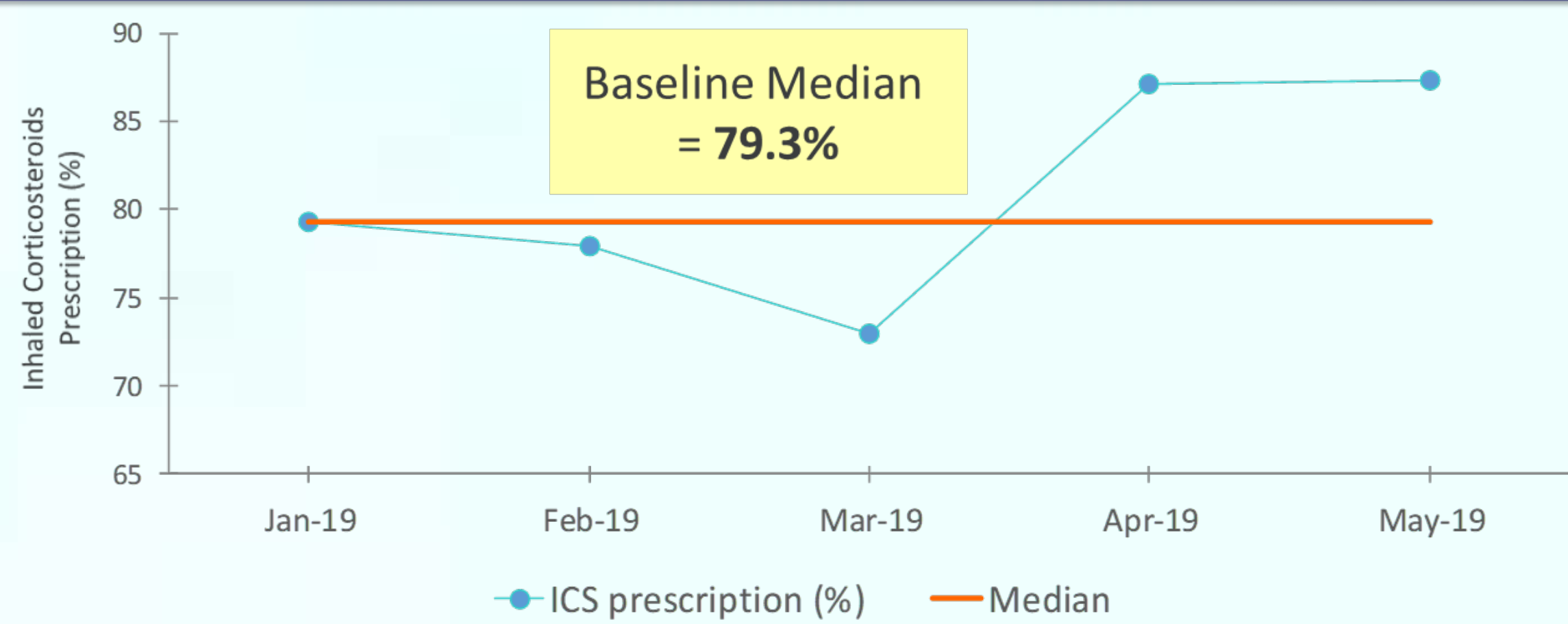
### Team Members

|                                | Name                           | Designation            | Department         |
|--------------------------------|--------------------------------|------------------------|--------------------|
| <b>Team Leader</b>             | Dr Esther Pang Pee Hwee        | Consultant             | RCCM               |
| <b>Team Members</b>            | Mr Lee Tingfeng                | Senior Pharmacist      | Pharmacy           |
|                                | Ms Neo Lay Ping                | Senior Nurse Clinician | Nursing Service    |
|                                | Ms Lathy Prabhakaran           |                        |                    |
|                                | Ms Tham Lai Mei                |                        |                    |
|                                | Dr Ang Joo Siang               | Consultant             | Emergency Medicine |
| Adj A/Prof Albert Lim Yick Hou | Senior Consultant              | RCCM                   |                    |
| <b>Sponsors</b>                | A/Prof John Abisheganaden      | Head                   | RCCM               |
|                                | Adj Asst Prof Ang Hou          | Head                   | Emergency Medicine |
| <b>Facilitator</b>             | Adj A/Prof Thomas Lew Wing Kit |                        |                    |

### Evidence for a Problem Worth Solving

1. Inhaled short-acting beta agonist (SABA) had been the first-line treatment for asthma for the last 50 years
2. SABA monotherapy is associated with poorer symptom control, increased risk of asthma exacerbations and asthma-related mortality.
3. Since 2019, Global Initiative of Asthma recommends that all asthmatic adults and adolescents should receive ICS-containing treatment to reduce the risk of asthma exacerbations.
4. However, patients often get discharged from Emergency Department (ED) without ICS after an asthma attack.

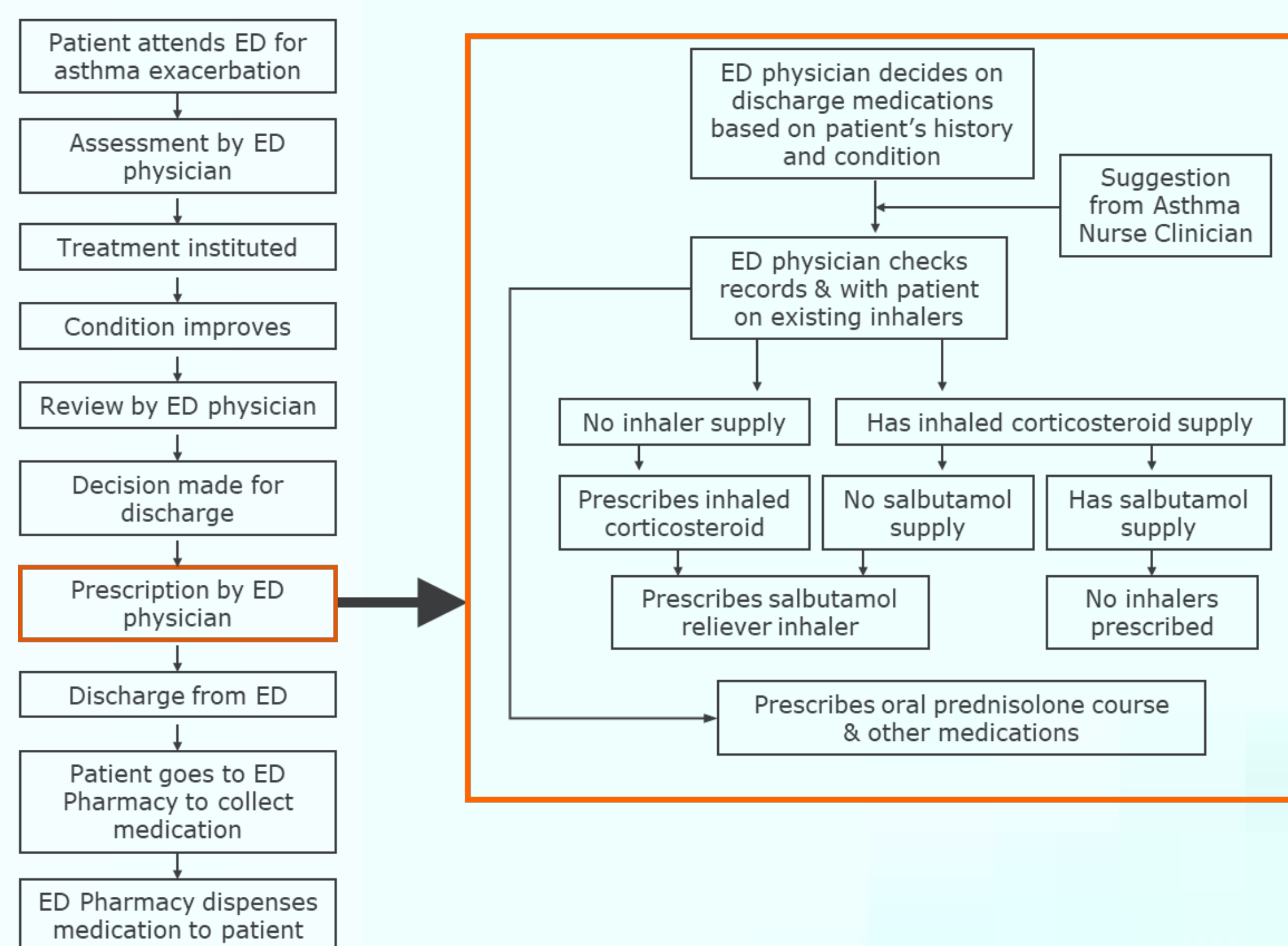
### Current Performance of a Process



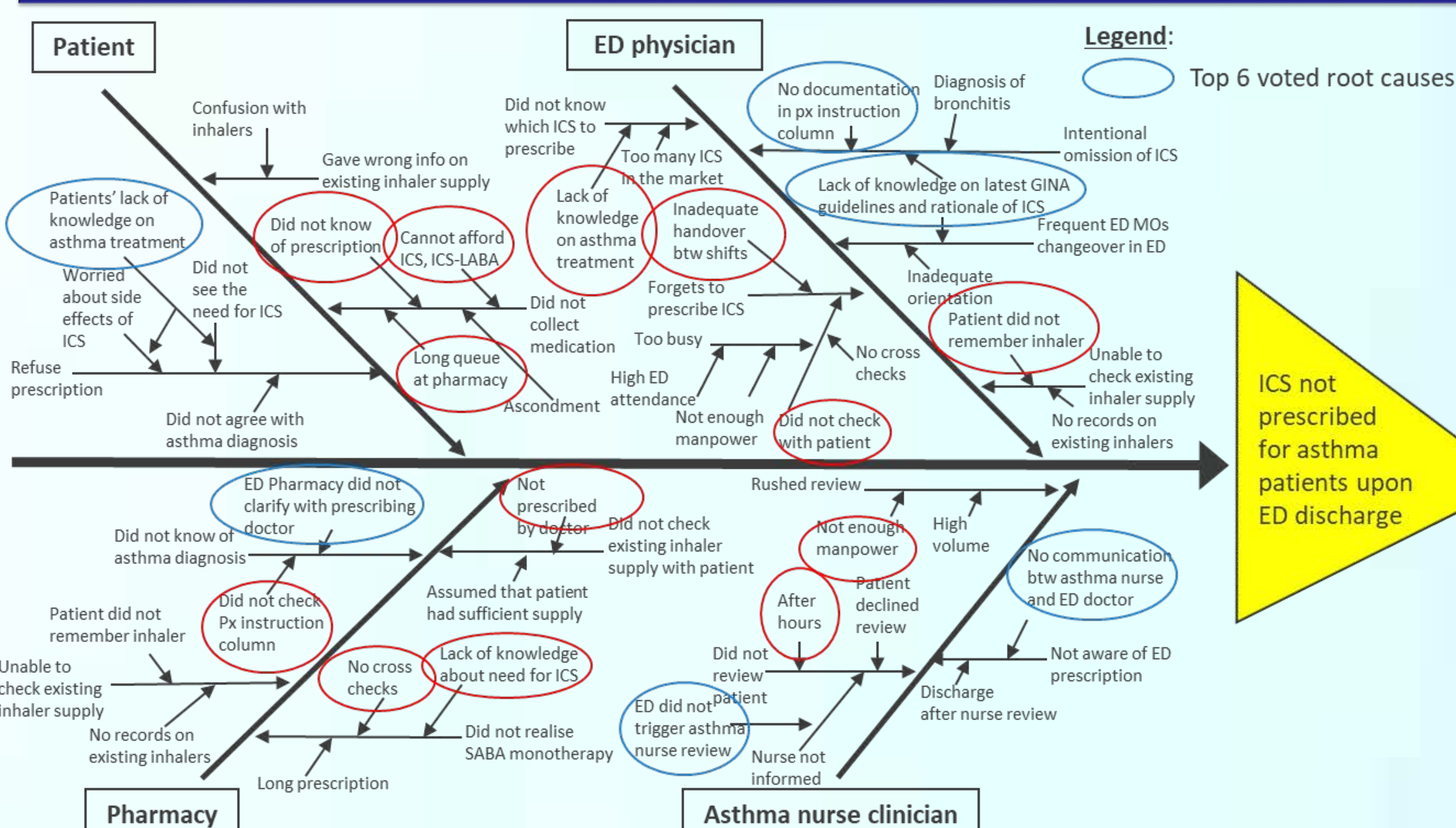
### Flow Chart of Process

#### MACRO FLOW

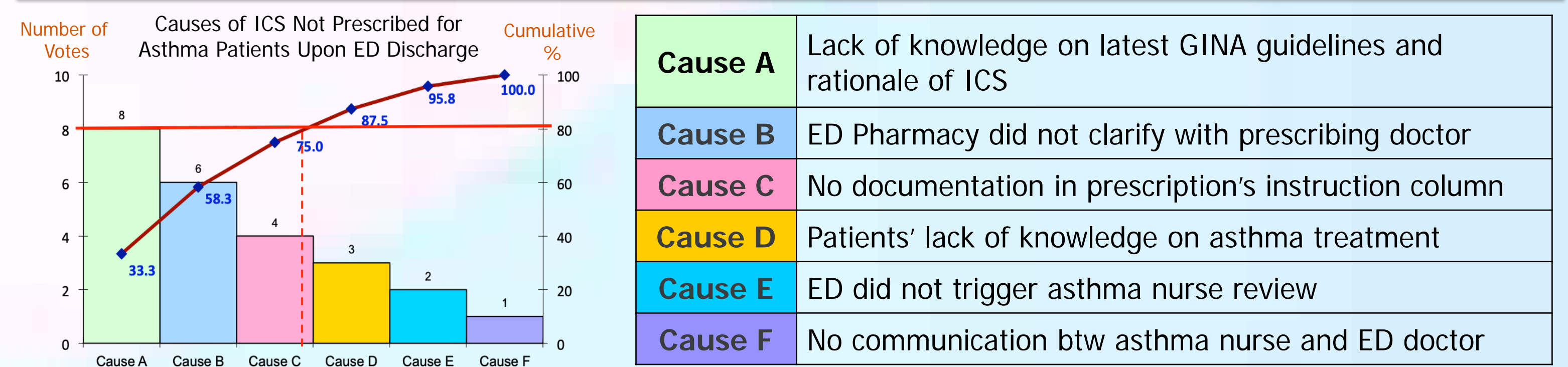
#### MICRO FLOW:



### Cause and Effect Diagram



### Pareto Chart



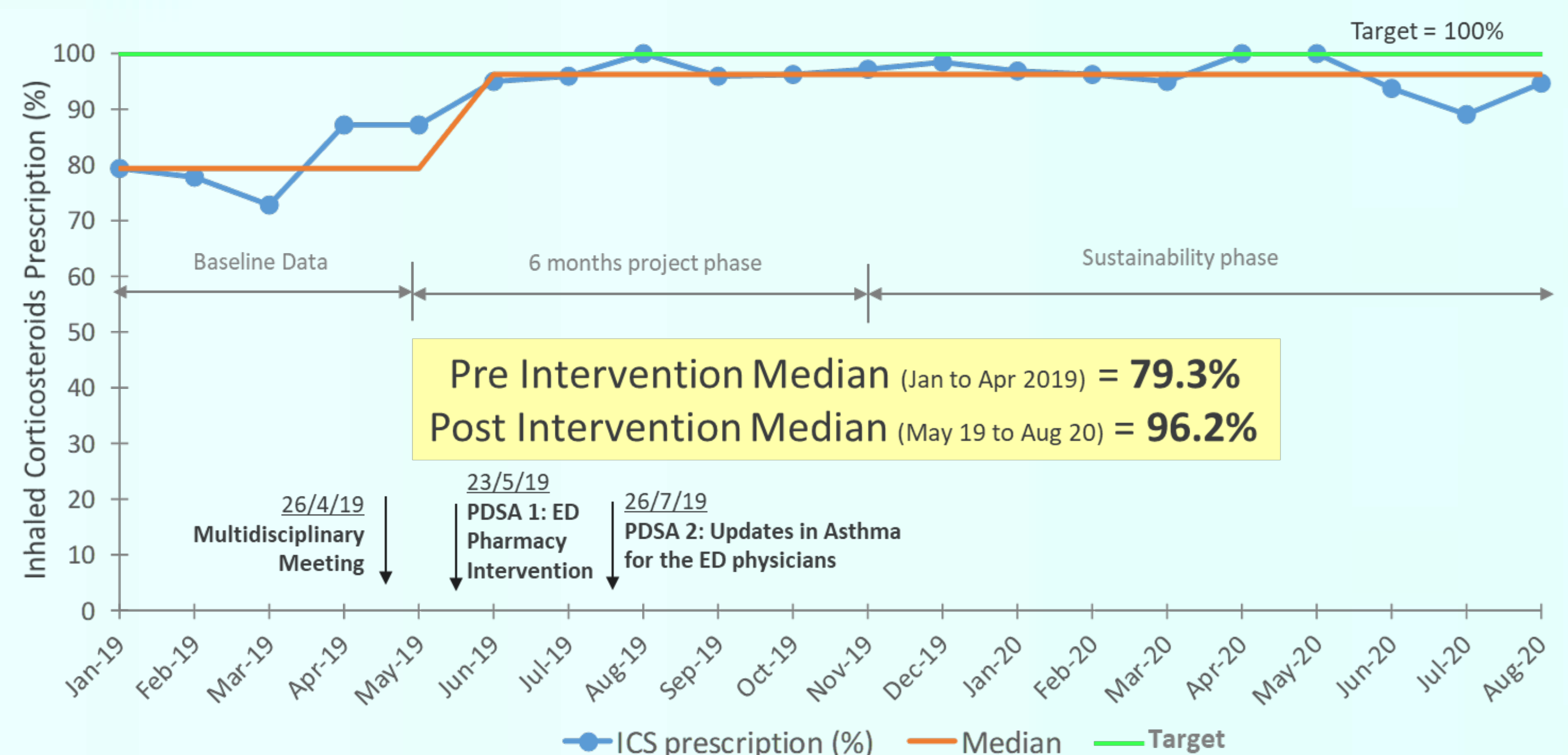
### Implementation

| Root Cause  | Intervention                            | Implementation Date |
|---|---|---------------------|
| Cause B: ED Pharmacy did not clarify with prescribing doctor              | ED pharmacy intervention                | 23 May 2019         |
| Cause A: Lack of knowledge on latest GINA guidelines and rationale of ICS | Updates in Asthma for the ED physicians | 26 July 2019        |
| Cause C: No documentation in prescription's instruction column            |   |                     |

### Results

#### Sustainability Phase: Runchart on Prescription of Inhaled Corticosteroids (ICS) in Asthma Patients Discharged from ED

Period: Jan 2019 to Aug 2020



|                      | Jan-19 | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug | Sep  | Oct  | Nov  | Dec  | Jan-20 | Feb  | Mar  | Apr | May | Jun  | Jul  | Aug  |
|----------------------|--------|------|------|------|------|------|------|-----|------|------|------|------|--------|------|------|-----|-----|------|------|------|
| ICS prescription (%) | 79.3   | 77.9 | 72.9 | 87.1 | 87.3 | 94.9 | 95.9 | 100 | 95.8 | 96.2 | 97.1 | 98.4 | 96.9   | 96.2 | 95.1 | 100 | 100 | 93.8 | 88.9 | 94.7 |
| ED asthma discharges | 82     | 68   | 70   | 62   | 63   | 59   | 49   | 49  | 47   | 52   | 68   | 64   | 65     | 52   | 41   | 23  | 22  | 16   | 27   | 19   |

### Cost Savings

|   | No admission   | Hospital admission for uncomplicated asthma | Hospital admission for complicated asthma |
|---|--|---|---|
| Average Length of Stay per patient*   | 0 days   | 3.9 days                                    | 6.2 days                                  |
| Median Cost per admission (B2 ward)*  | \$0  | \$1172                                      | \$1560                                    |
|   | Jan - Mar (pre CPIP)                                     | Apr - Jun (During PDSA)                     | Jul - Sept (post PDSA)                    |
| Number of Hospital admissions within 30 days                                | 10   | 4   | 4   |
| Ward Bed Days Savings (12 month period)                                     | 4 x 6 x (3.9 to 6.2 days) = <b>93.6 to 148.8 days</b>    |   |   |
| Estimated Cost Savings from prevented hospital admissions (12 month period) | 4 x 6 x (\$1172 to \$1560) = <b>\$28,128 to \$37,440</b> |   |   |
| Number of ED re-attendances within 30 days                                  | 26   | 21  | 14  |
| Estimated Costs per ED attendance   | \$128  |   |   |
| Estimated Cost Savings from prevented ED re-attendances (3 month period)    | (7 to 12) x \$128 = <b>\$896 to \$1,536</b>              |   |   |

\*MOH Fee Benchmarks and Bill Amount Information (2020)

### Problems Encountered

1. Some patients refused ICS - did not understand the importance of ICS due to lack of patient education, concerns of side effects and cost.
2. Frequent junior ED physician turnover - not familiar with rationale of ICS for all asthma

### Strategies to Sustain

1. Improve patient education - asthma discharge advice, videos on coping after an asthma attack and inhaler techniques
2. Asthma nurse clinicians to follow up with patients treated and discharged from ED (face to face review or telephonic call)
3. Regular quarterly feedback of ICS prescription rates to ED pharmacy and ED physicians
4. Regular updates in asthma for ED physicians by RCCM
5. ED Medical Officer orientation pack and Asthma Policy & Procedure