



COPD with acute exacerbation in Soidao hospital

October 2013- September 2015

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Introduction

- Exacerbation of COPD is defined as
 - an acute event
 - characterized by
 - worsening of patient's respiratory symptoms that is beyond normal day-to-day variations
 - and leads to a change in medication

Introduction (2)

- **Exacerbations**

- important **outcome measure** in COPD
- effect on the patient's **quality of life and prognosis**
- Patients with COPD suffer **one to four exacerbations per year**
- Less than one-third of exacerbations are reported
 - some may not be serious enough to warrant an emergency visit or hospitalization

Introduction (3)

- **Exacerbations are not random events**
 - cluster in a high-risk period for recurrence in the 8-week period after an initial exacerbation
- They also become **more frequent and severe as the severity of the underlying COPD increases** and **contribute to further impairment in lung function.**

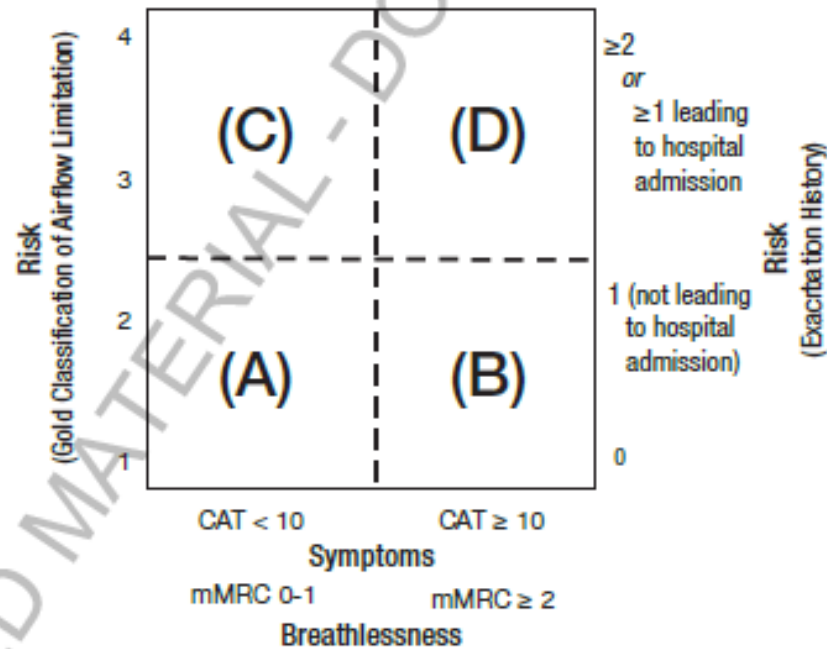
COPD and comorbidities

Significant impact on prognosis

- **Cardiovascular disease** (IHD, HF, AF, HT): major comorbidity
- **Osteoporosis, anxiety/depression, and impaired cognitive function** : often under-diagnosed
- **Lung cancer**: most frequent cause of death in mild COPD
- **Serious infections**
- **Metabolic syndrome, diabetes**

Table 4. Combined Assessment of COPD

When assessing risk, choose the **highest risk** according to GOLD grade or exacerbation history.
 (One or more hospitalizations for COPD exacerbations should be considered high risk.)




| Patient | Characteristic | Spirometric Classification | Exacerbations per year | CAT | mMRC |
|---------|----------------------------|----------------------------|------------------------|------|------|
| A | Low Risk Less Symptoms | GOLD 1-2 | ≤ 1 | < 10 | 0-1 |
| B | Low Risk More Symptoms | GOLD 1-2 | ≤ 1 | ≥ 10 | ≥ 2 |
| C | High Risk Less Symptoms | GOLD 3-4 | ≥ 2 | < 10 | 0-1 |
| D | High Risk More Symptoms | GOLD 3-4 | ≥ 2 | ≥ 10 | ≥ 2 |

Objectives

- To study the epidemiology of COPD and acute exacerbation in Soidao hospital during October, 2013 – September, 2015 (ปีงบประมาณ 2557-2558)
- To study re-visit, re-admission, and precipitating factors of COPD with AE
- To study the uncontrolled group in COPD clinic patients
- To analyze the root- cause of COPD with acute exacerbation

Method

- Data collection: from COPD clinic in Soidao hospital
- Categorization and review medical record via HOSxP
- Data analysis, discussion and summary



RESULTS

Epidemiology of COPD patient in Soidao Hospital ปีงบประมาณ 2557-2558

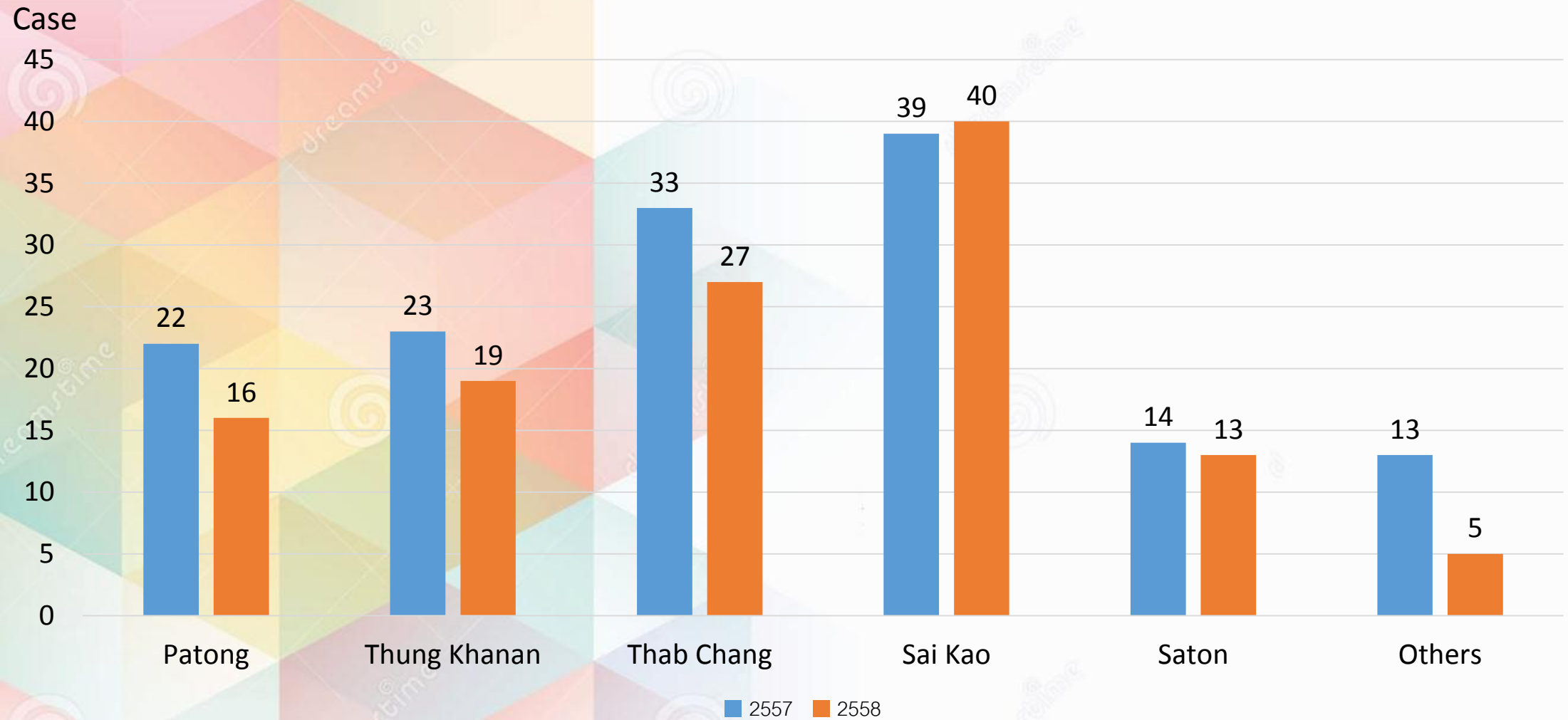
| | 2557 | 2558 |
|-------------------------------|-------------|------------|
| Number of COPD patient | 144 | 120 |
| Sex | | |
| male | 106(73.61%) | 92(76.67%) |
| Female | 38(26.39%) | 28(23.33%) |
| Age | | |
| Less than 40 yr-old | 5(3.47%) | 0(00.00%) |
| 41-60 yr-old | 33(22.92%) | 32(26.67%) |
| More than 60 yr-old | 106(73.61%) | 88(73.33%) |
| Comorbidity | | |
| Cardiovascular disease | 52(36.11%) | 43(35.83%) |
| DM | 7(4.86%) | 8(6.67%) |
| Impaired cognitive | 4(2.78%) | 7(5.83%) |
| Osteoporosis | 1(0.69%) | 0(00.00%) |
| Lung cancer | 0(00.00%) | 0(00.00%) |

| | 2557 | 2558 |
|-------------------------------|------------|------------|
| Number of COPD patient | 144 | 120 |
| COPD clinic | | |
| Yes | 93(64.58%) | 80(66.67%) |
| No | 51(35.42%) | 40(33.33%) |
| Smoking | | |
| Active | 39(27.08%) | 26(21.67%) |
| Stopped | 57(39.58%) | 55(45.83%) |
| Never | 48(33.34%) | 39(32.50%) |

Discussion

- ข้อมูลของทั้ง 2 ปีเป็นไปในแนวทางเดียวกันทั้งหมด
- ผู้ป่วยชาย > หญิง : smoking
- ส่วนใหญ่เป็นกลุ่มผู้สูงอายุ : natural history of disease
- ผู้ป่วยส่วนใหญ่มี Cardiovascular disease เป็น comorbidity
- ผู้ป่วยประมาณ 60% อยู่ใน COPD clinic
- ผู้ป่วยส่วนใหญ่เลิกสูบบุหรี่แล้ว รองมาคือไม่เคยสูบบุหรี่ และสูบบุหรี่อยู่น้อยที่สุด

COPD case in Soidao hospital categorized by districts



Epidemiology of acute exacerbation

| | 2557 (% , No/case) | 2558 (% , No/case) |
|-----------------------------|--------------------|--------------------|
| Number of AE | 386 (2.68) | 359 (2.99) |
| Sex | | |
| Male | 289(74.87%, 2.73) | 269(74.93%, 2.92) |
| Female | 97(25.13%, 2.55) | 90(25.07%, 3.21) |
| Age | | |
| <=40 | 6(1.55%, 1.2) | 0 |
| 41-60 | 77(19.95%, 2.33) | 110(30.64%, 3.43) |
| >60 | 303(78.50%, 2.86) | 249(69.36%, 2.83) |
| Comorbidity | | |
| Cardiovascular diseases | 153(39.64%, 2.94) | 106(29.53%, 2.47) |
| Impaired cognitive function | 7(1.81%, 1.00) | 43(11.98%, 5.38) |
| DM | 8(2.07%, 2.00) | 17(4.74%, 2.43) |
| Osteoporosis | 21(5.44%, 21.00) | 0 |
| Lung cancer | 0 | 0 |

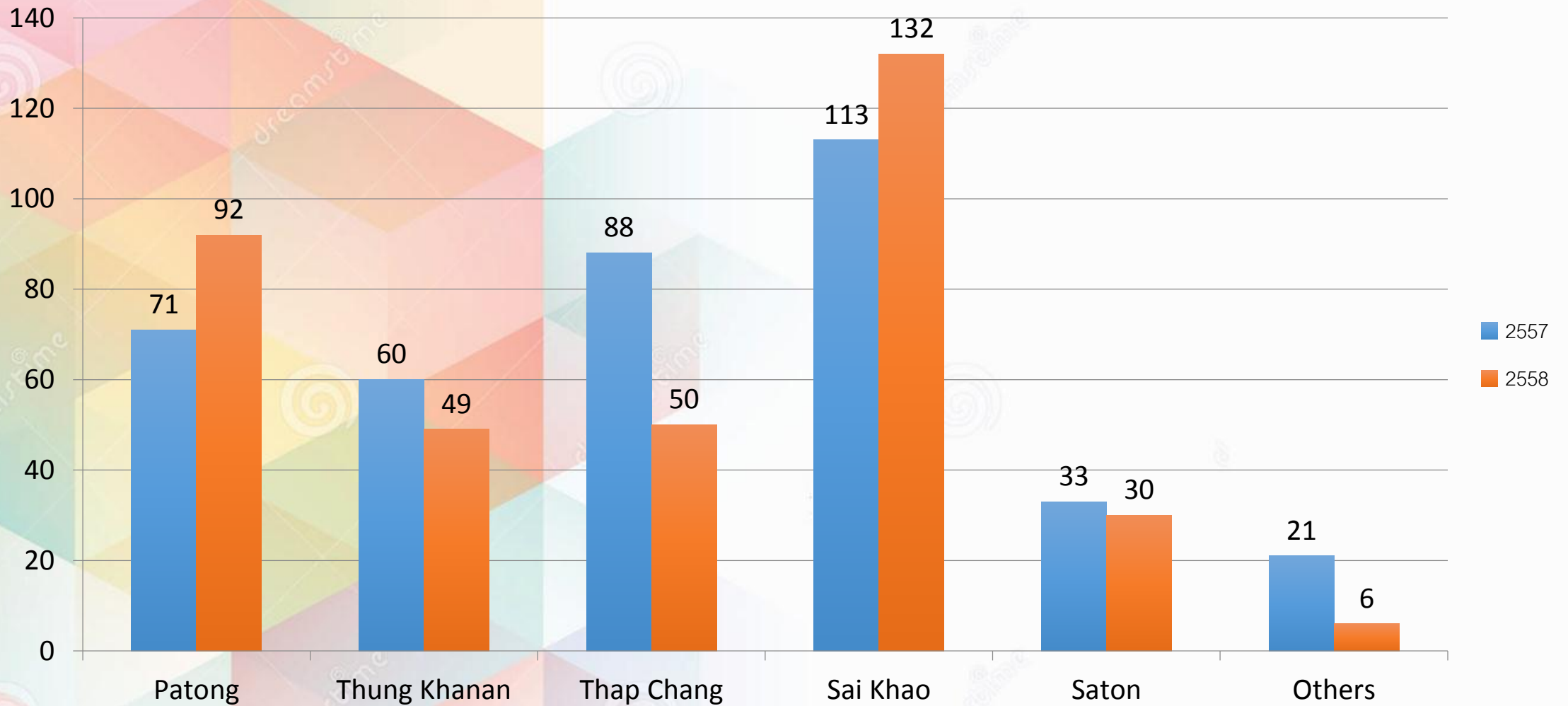
Epidemiology of acute exacerbation

| | 2557 (% , No/case) | 2558 (% , No/case) |
|----------------------------------|--------------------|--------------------|
| Number of AE (No/case) | 386 (2.68) | 359 (2.99) |
| Clinic COPD (% , No/case) | | |
| Yes | 264(68.40%, 2.84) | 275 (76.60%, 3.44) |
| No | 122(31.60%, 2.39) | 84(23.40%, 2.10) |
| Smoking | | |
| Active | 75(19.43%, 1.92) | 79(22.00%, 3.04) |
| Stop | 209(54.15%, 3.67) | 163(45.40%, 2.96) |
| Never | 102(26.42%, 2.13) | 117(32.60%, 1.98) |

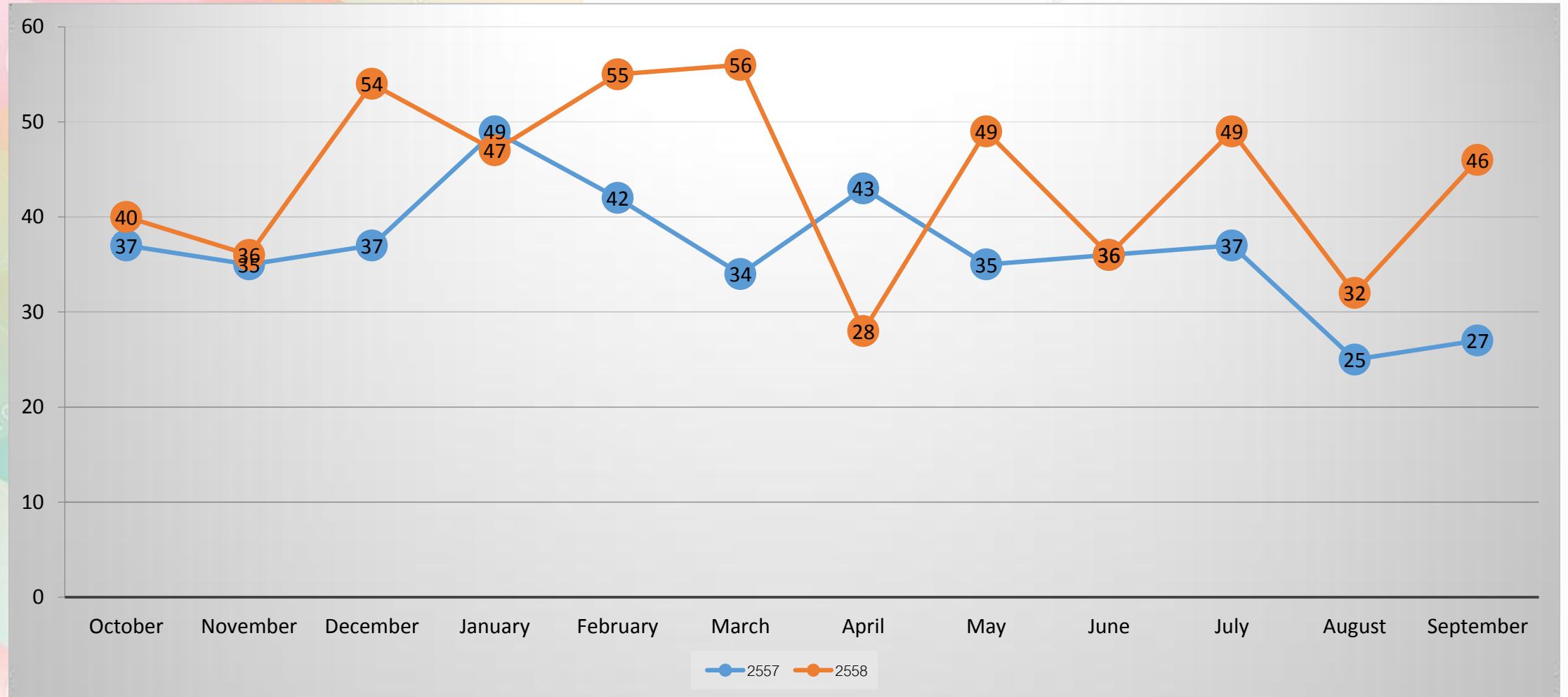
Discussion

- จำนวนครั้งที่เกิด AE ของสองปีใกล้เคียงกัน ปี 2558 มีจำนวน AE ต่อคนสูงขึ้น
- เพศชายและหญิง จำนวน AE ต่อคนใกล้เคียงกัน
- ยิ่งอายุมากขึ้น จำนวน AE ต่อคนยิ่งสูงขึ้น
- Comorbidity ทั้งสองปีข้อมูลไม่เป็นในทางเดียวกัน เนื่องจากบางคนมี comorbidity ร่วมกันหลายโรคและมี severity ที่รุนแรง ทำให้บางโรคดูมี AE บ่อยกว่าโรคอื่น
- คนที่อยู่ใน COPD clinic มี AE บ่อยกว่า น่าจะเพราะมี severity of disease มากกว่า
- ในปี 2557 คนที่หยุดสูบบุหรี่แล้ว เกิด AE บ่อยสุด ส่วนในปี 2558 คนที่ยังสูบบุหรี่อยู่เกิดบ่อยสุด

Number of AE in Soidao hospital



Numbers of AE in each month



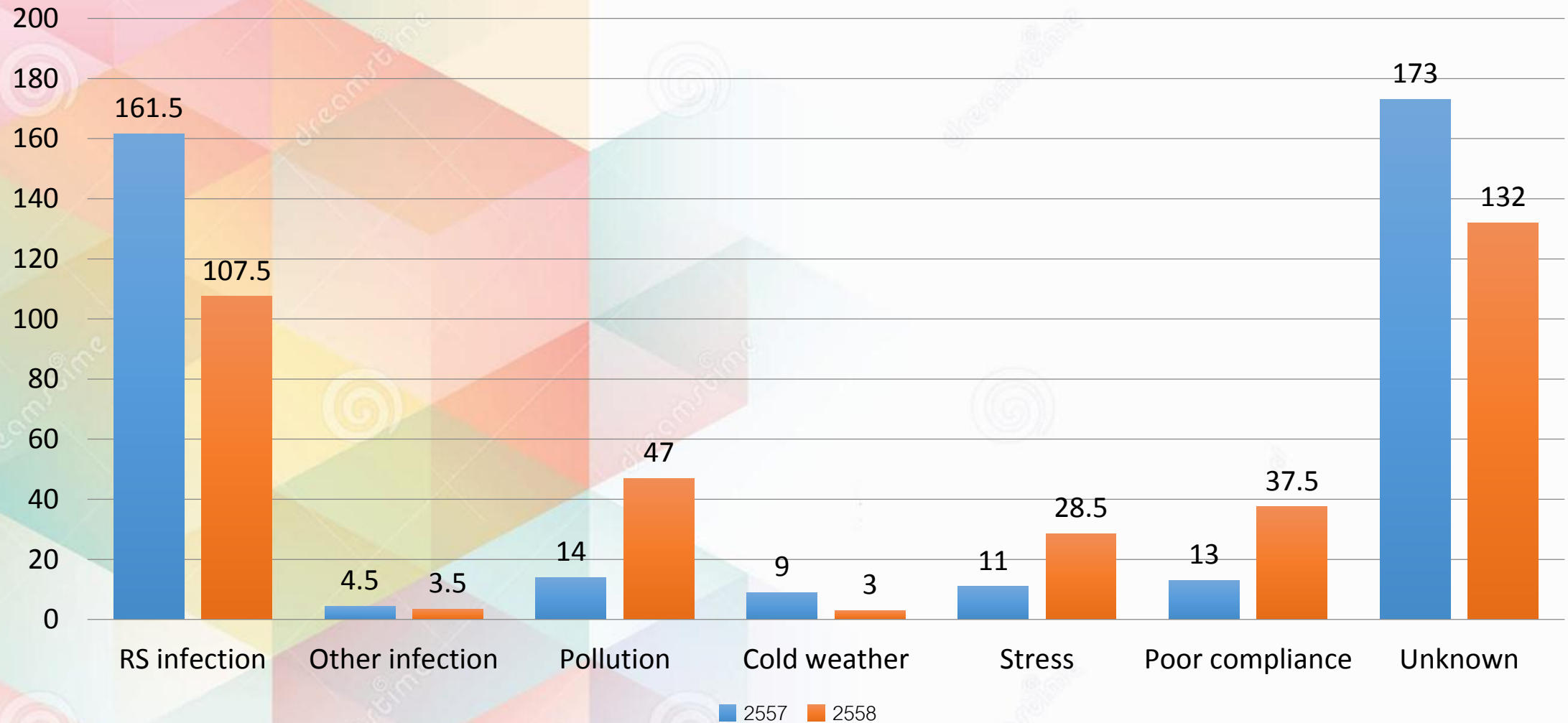
Discussion

- มีอุบัติการณ์ COPD with acute exacerbation ในปีงบประมาณปี 2558 สูงกว่าปี 2557 ในทุก ๆ เดือนยกเว้นเดือนเมษายน
- มีอุบัติการณ์สูงสุดในช่วงสามเดือนแรกของปี

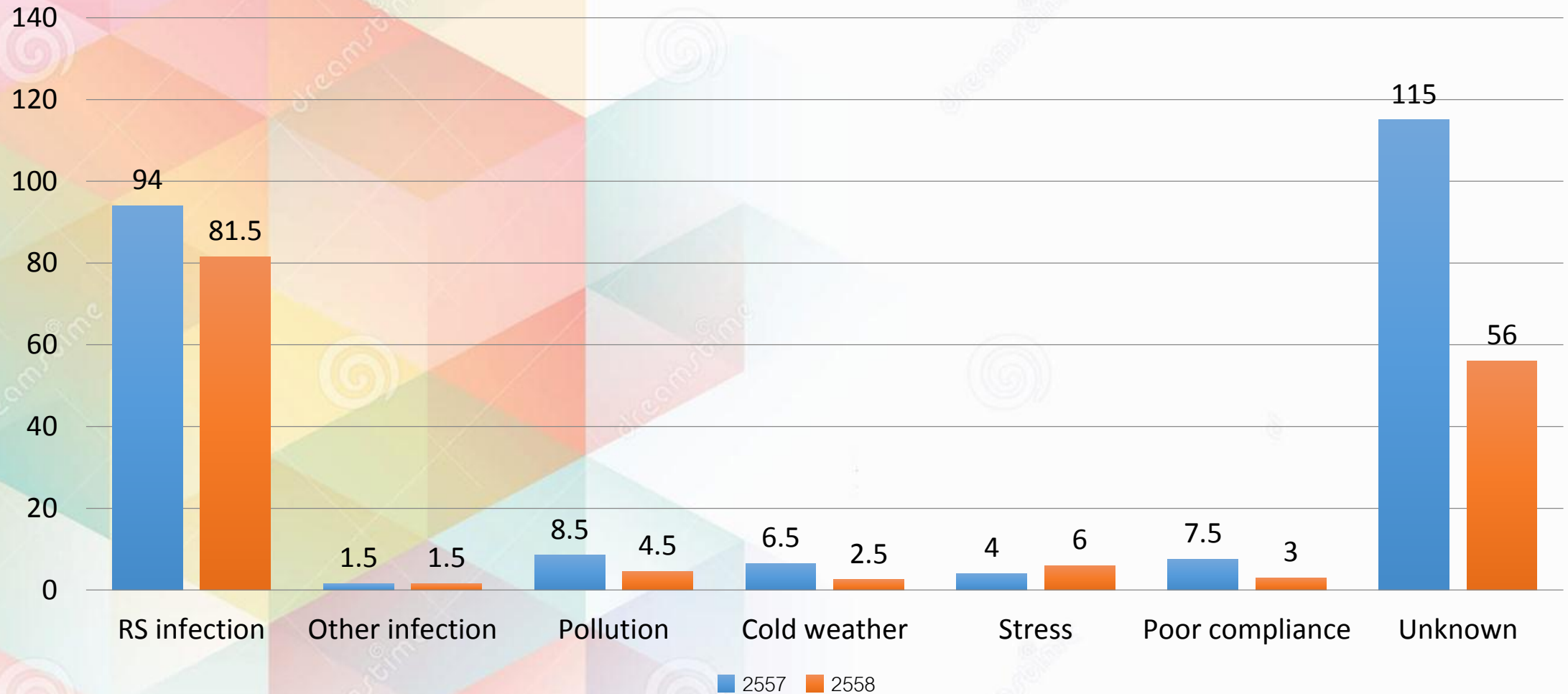
Admission, re-visit, and re-admission of AE

| | 2557 | 2558 |
|-------------------------------|------------|-----------|
| COPD case | 144 | 120 |
| Numbers of AE | 386 | 359 |
| Numbers of AE per case | 2.68 | 2.99 |
| Admission (% of No. AE) | 155(40.16) | 96(26.74) |
| Re-visit (% of No. AE) | 23(5.96) | 9(2.51) |
| Re-admission (% of No. admit) | 26(16.77) | 33(34.38) |

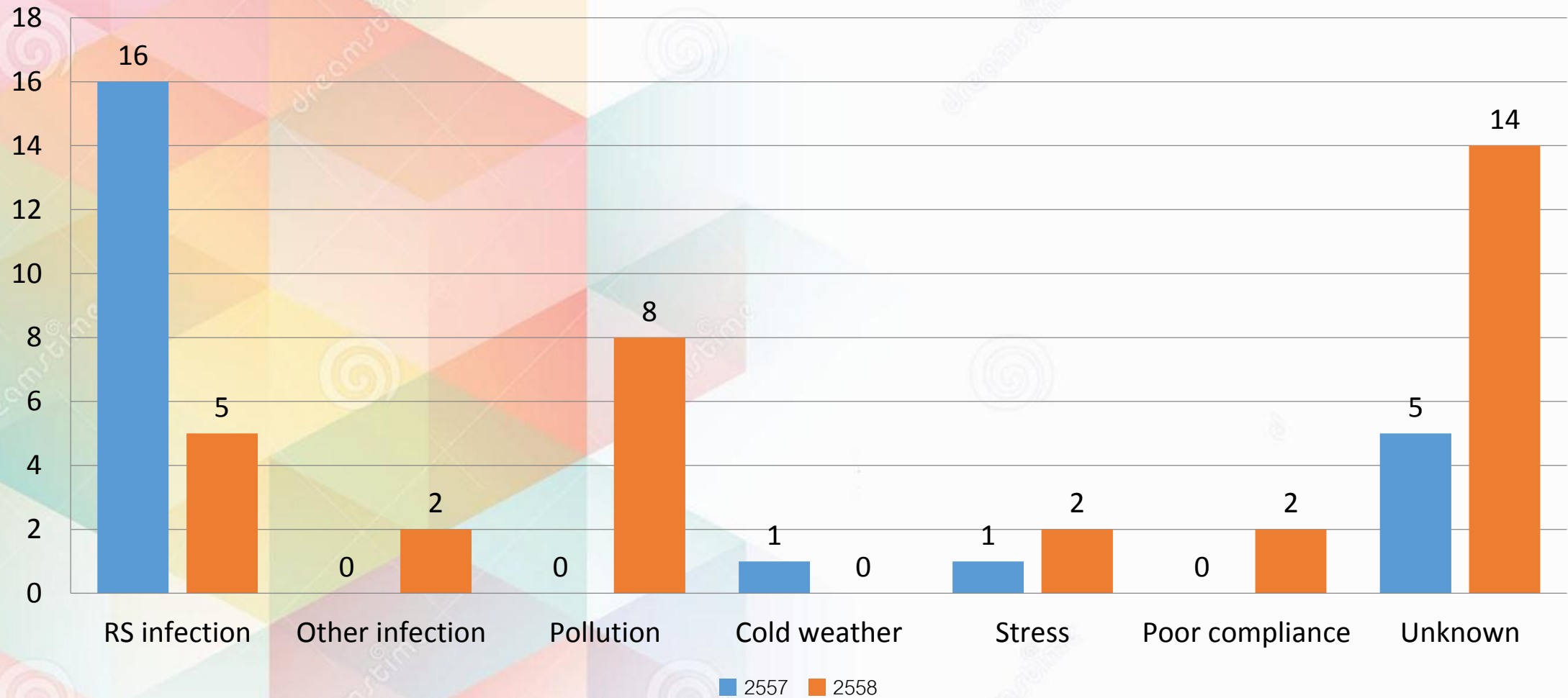
Precipitating factors of AE



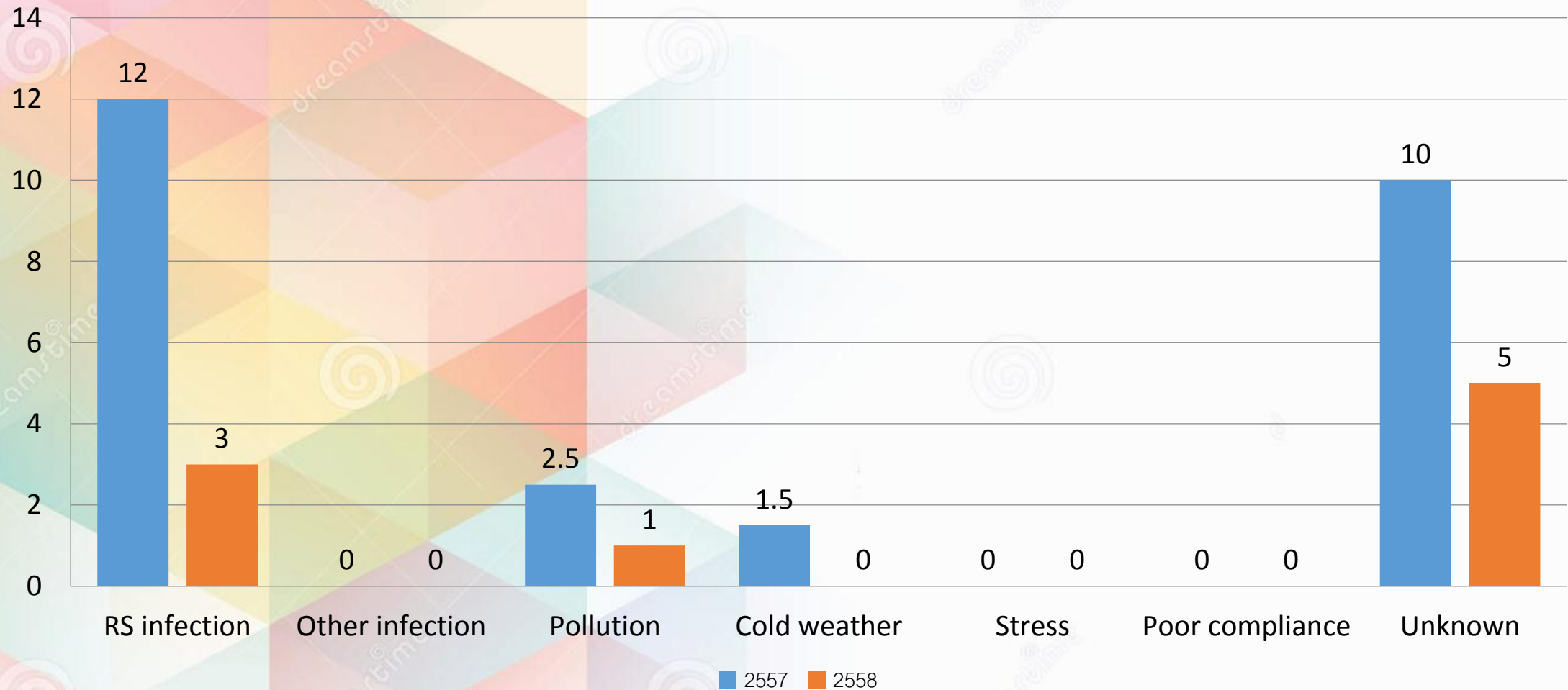
Precipitating factors of admit AE



Precipitating factors of re-visit AE



Precipitating factors of re-admission AE



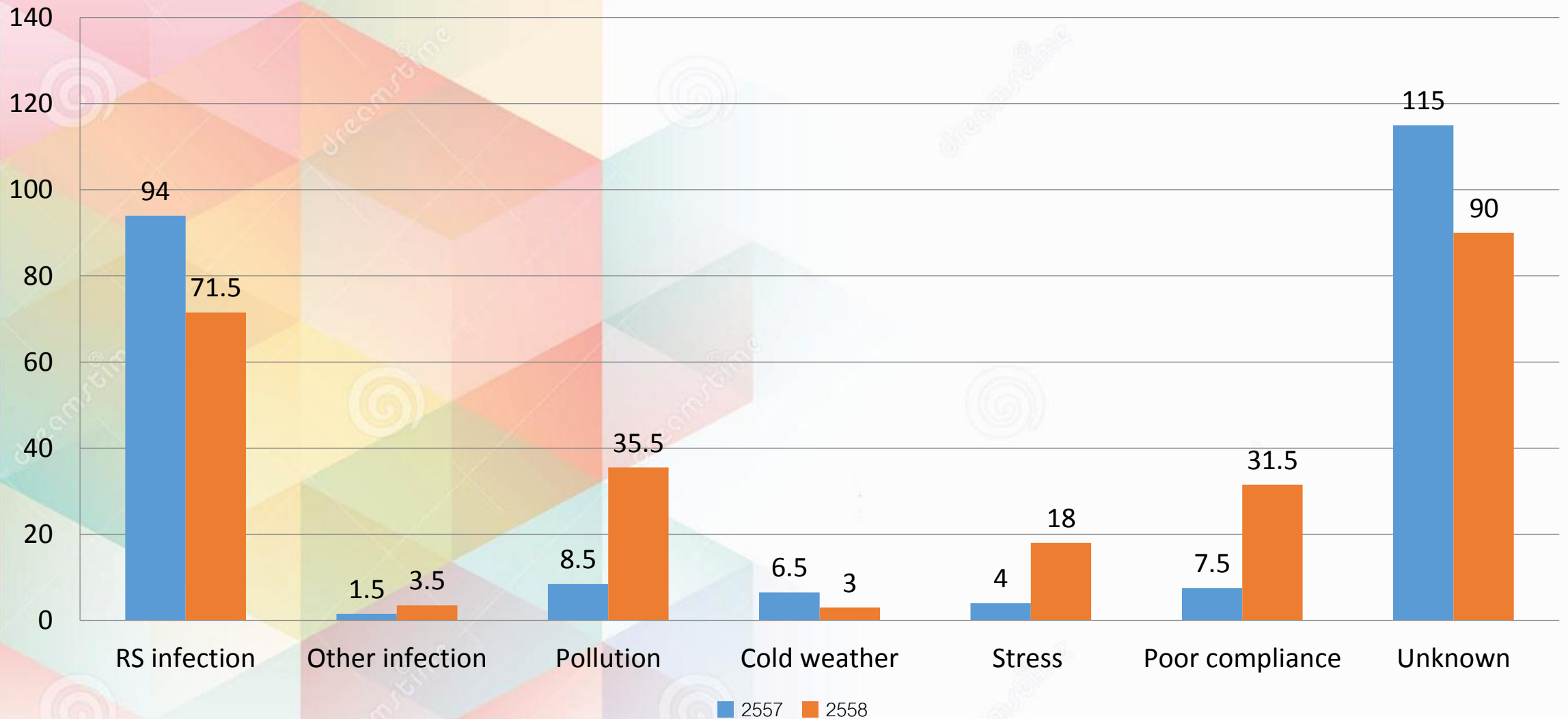
Discussion

- ปี 2558 admit น้อยลง re-visit น้อยลง แต่ re-admit เพิ่มขึ้น
- Precipitating factors of AE, admit, re-visit, re-admit ที่เยอะสุด คือ unknown และ RS infection ส่วน precipitating factors อื่นๆ พอๆกัน

Patients in COPD clinic

| | 2557 | 2558 |
|------------------------------|--------------------|--------------------|
| COPD Clinic | 93 | 80 |
| Number of AE | | |
| คน ครั้ง | 89 (95.70%) 264 | 71 (88.75%) 275 |
| Uncontrolled Group คน | 62 (66.67%) | 49 (61.25%) |

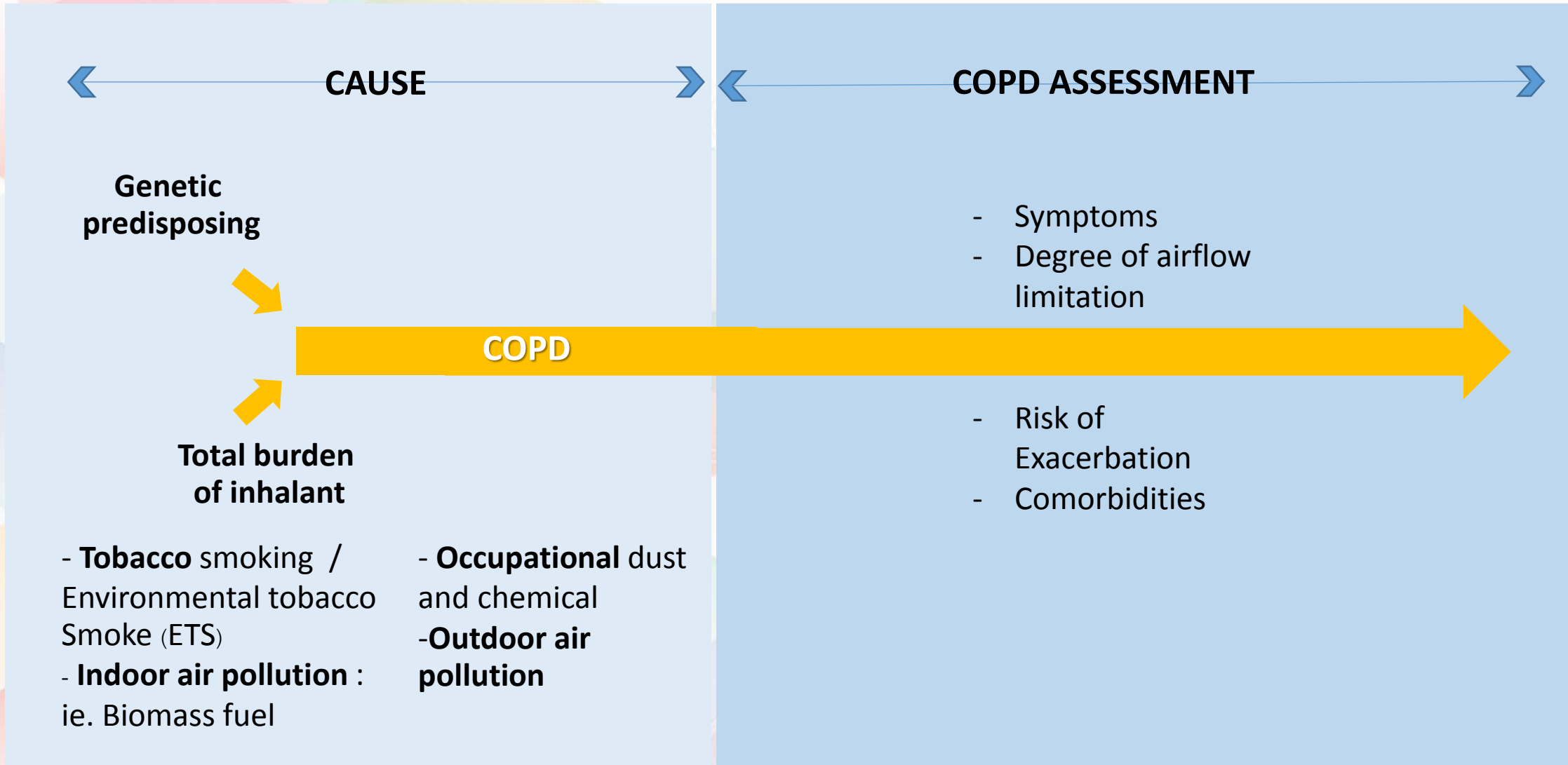
Precipitating factors of AE in uncontrolled case in COPD clinic



Discussion

- จำนวนผู้ป่วย COPD clinic ที่มี acute exacerbation ในปี 2558 ลดลงจาก 2557
- จำนวนผู้ป่วย COPD clinic ที่เป็น uncontrolled group ($AE \geq 2$, or $admit \geq 1$ /year) ในปี 2558 ลดลงเช่นกัน

Root Cause Analysis : COPD with AE



Root Cause Analysis : COPD with AE (2)

COPD ASSESSMENT

Symptoms

: COPD Assessment Test (CAT),
Clinical COPD Questionnaire (CCQ),
Modified British Medical Research Council (mMRC)

***Risk of Exacerbation :

- Increased as airflow limitation worsen
- The best predictor of having frequent exacerbations (2 or more per year) is "A history of previous treated events"

COMBINED ASSESSMENT OF COPD

Degree of Airflow Limitation :

Spirometry : FEV1 -> Gold 1-4
(mild to very severe)

Comorbidities :

- Cardiovascular disease
- Osteoporosis
- Depression
- Anxiety
- Skeletal muscle dysfunction
- Metabolic syndrome
- Lung cancer

These may influence mortality and hospitalization

Root Cause Analysis : COPD with AE (3)

CURRENT TREATMENT : STABLE COPD

Smoking Cessation ?

Physical activity ?

- can maintain normal physical activity?
- exercise

COMPLIANCE

Prevention ? Avoid :

- Occupational exposure
- Indoor and Outdoor pollution

- **BRONCHODILATOR** (Beta2-agonists , Anti-Cholinergics , theophylline) or combined therapy.

- Long acting are more effective than short acting to Reduce symptoms , exacerbation , and hospitalization

- **INHALED CORTICOSTEROID**

- Withdrawal may lead to exacerbation in some patients

COMPLIANCE – AVAILABILITY – INDIVIDUAL RESPONSE

- **ORAL CORTICOSTEROID**

- **PHOSPHODIESTERASE-4 INHIBITORS** : + oral steroid

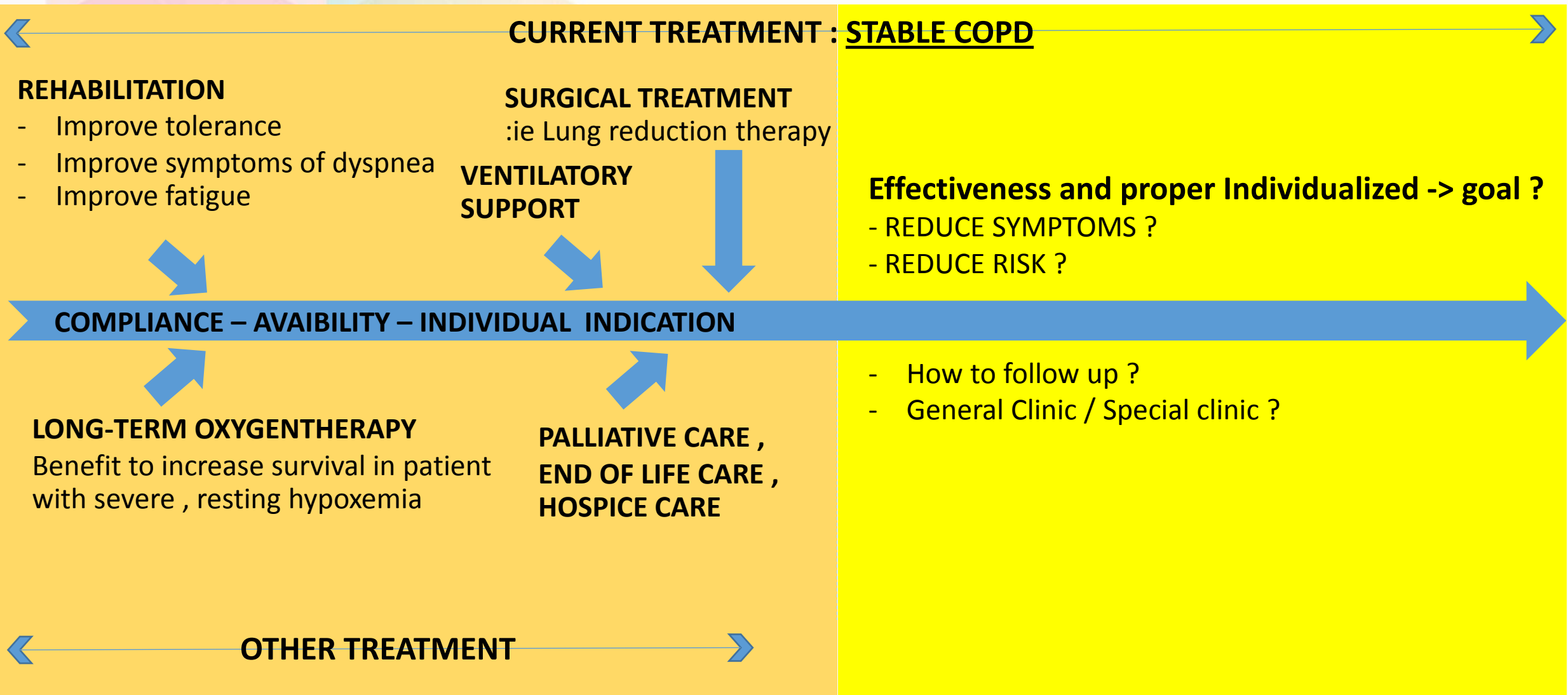
Reduce AE in Patient GOLD3-4 with History of exacerbation and chronic bronchitis (Long-term treatment)

- Other pharmacological treatment : **VACCINATION** ,
Antibiotics , **Mucolytic agent** , **Antitussive** , **Vasodilator**

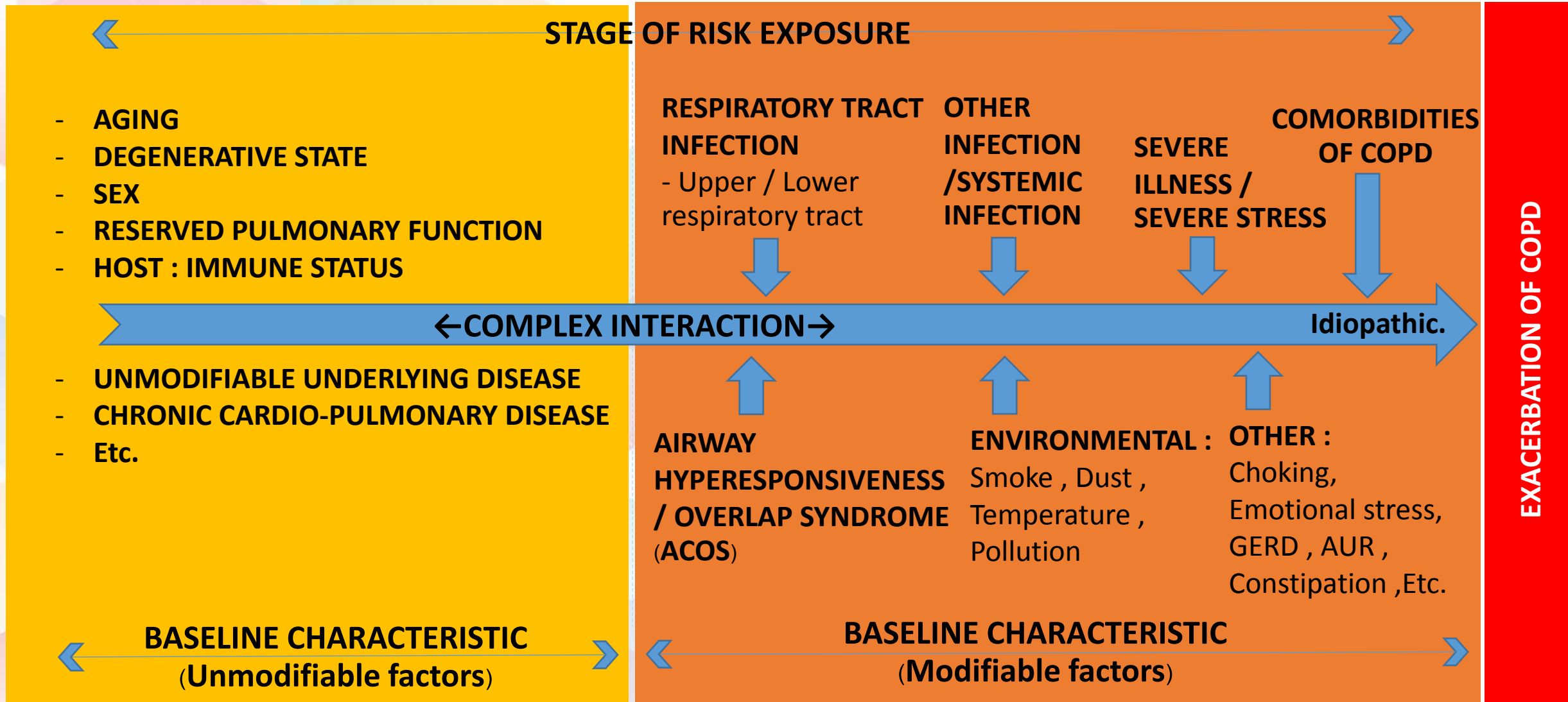
NON-PHARMACOLOGICAL TREATMENT

PHARMACOLOGICAL TREATMENT

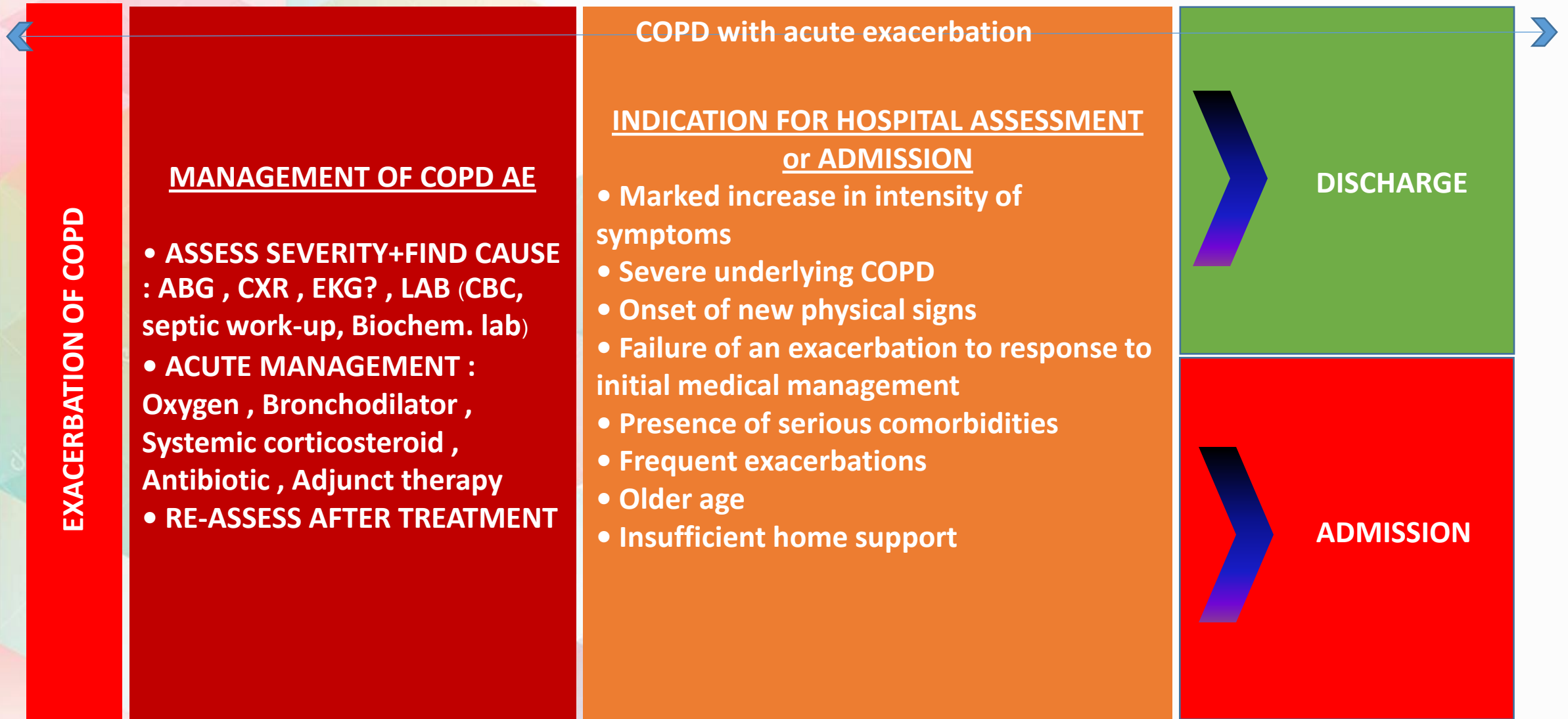
Root Cause Analysis : COPD with AE (4)



Root Cause Analysis : COPD with AE (5)



Root Cause Analysis : COPD with AE (6)



Conclusion

- Base on medical record in HOSxP program in Soidao hospital , the most frequent **precipitating factors** of AE of COPD were not identified , followed with RS infection , pollution , compliance problems , severe stress , cold weather and other infection , subsequently.
- These may be due to other **un-modifiable factors** and **predisposing factors** such as baseline characteristic of individual and some may be due to **poor medical record** (ie. No conclusion record after IPD case).
- The exact numbers and differentiated causes of Acute exacerbation of COPD was still unknown , due to no officially studies in Thailand.

- According to *Wipa Reechaipichitkul's articles* *
- **the precipitating cause** of exacerbation were
 - Pneumonia (36.7%)
 - bronchitis (27.8%)
 - heart failure (8.2%)
 - infected bronchiectasis (5.3%)
 - diarrhea (1.2%)
 - acute urinary retention (0.8%)
 - unstable angina (0.4%)
 - pneumothorax (0.4%)
 - urinary tract infection (0.4%)
 - atrial fibrillation (0.4%)
 - drug induced cough (0.4%)

* *Wipa Reechaipichitkul's articles* (Asian Biomedicine Vol. 8 No. 2 April 2014; 229-236) (the study evaluated characteristics of COPD patients with frequent exacerbations at Srinagarind Hospital between 1 January 2006 and 31 December 2010.)

- These may be helpful to find out the other possible precipitating causes in unknown groups with more RS and CVS symptoms' details. With the definite cause(s) identified , further specific management may be helpful in clinical course.

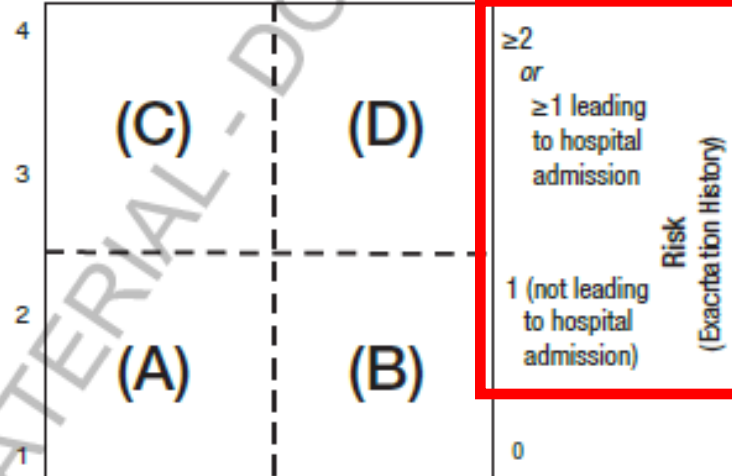
Suggestion

- GOLD guideline: **COPD ASSESSMENT** (group (A) to (D)) → proper treatments & predictive factor for long term complications esp. risk of AE events
- In medical record: 4 parts of assessment
 1. **Symptoms** assessment in each visit
 2. **Degree of airflow limitation**: pulmonary function test to assess disease progression
 3. **Risk of Exacerbation**: a history of previous treated events recorded/frequency of exacerbation record
 4. **Comorbidities**
- Or at least for possible simple Patient Grouping , an annually assessment of
 1. History of exacerbation/admission(s) due to AE
 2. CAT/mMRC should be identified and recorded in all medical record systems) i.e. in the form of Color codes / Sticker systems

Table 4. Combined Assessment of COPD

When assessing risk, choose the **highest risk** according to GOLD grade or exacerbation history.
(One or more hospitalizations for COPD exacerbations should be considered high risk.)

Risk
(Gold Classification of Airflow Limitation)



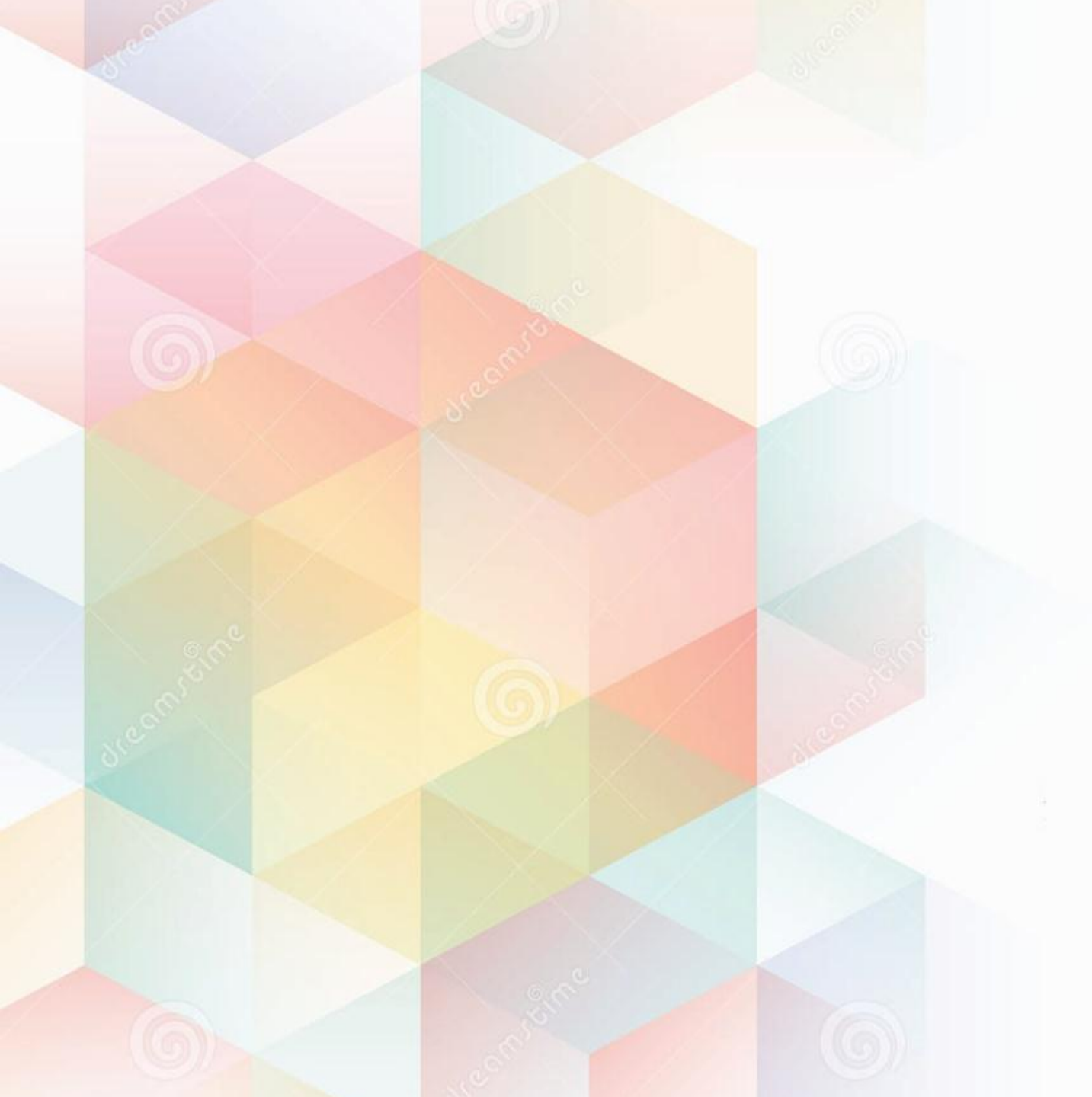
CAT < 10 CAT \geq 10
 Symptoms
 mMRC 0-1 mMRC \geq 2
 Breathlessness

| Patient | Characteristic | Spirometric Classification | Exacerbations per year | CAT | mMRC |
|---------|----------------------------|----------------------------|------------------------|-----------|----------|
| A | Low Risk Less Symptoms | GOLD 1-2 | ≤ 1 | < 10 | 0-1 |
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| C | High Risk Less Symptoms | GOLD 3-4 | ≥ 2 | < 10 | 0-1 |
| D | High Risk More Symptoms | GOLD 3-4 | ≥ 2 | ≥ 10 | ≥ 2 |

-> Help to separate the severe COPD patients for

- Emergency decisions
- Proper follow-up
- Patient-based treatments
- Further management in tertiary hospital
- The continuity of treatment in OPD \leftrightarrow ER \leftrightarrow Overtime
- Appropriate decision for each exacerbation (OPD vs IPD case)

-> ¹prevent complications in the future , ²slow down declination of Pulmonary function / course of disease , ³decrease **the numbers of Re-visit and re-admissions**



Thank you