A Validation Exercise: Identifying Hospitalizations for Heart Failure Among Patients With COPD in CPRD

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DISCLOSURES

BACKGROUND

- The validity of algorithms to identify hospitalizations for heart failure (HF) among patients with chronic obstructive pulmonary disease (COPD) in the United Kingdom's Clinical Practice Research Datalink (CPRD) has not been described.

OBJECTIVE

- We aim to validate potential cases (including deaths) of hospitalization for HF among patients with COPD aged 40 years or older in CPRD, as part of the post-authorization safety study EUPAS13616 (available at: http://www.encepp.eu/encepp/viewResource.htm?id=26308).

METHODS

- Study population: cohort of new users of selected COPD medications (September 2012-June 2017) in CPRD

- The electronic algorithm was adapted from Saczynski et al.,[2] and the data sources were:

  - Primary and secondary discharge diagnoses for HF in the Hospital Episode Statistics (HES)

  - HF recorded as cause of death in the Office for National Statistics (ONS) and a code for HF hospitalization within 30 days before in CPRD General Practitioner Online Database (GOLD)

  - HF diagnosis and a record for hospitalization within 30 days in CPRD-GOLD, when linkage to HES/ONS was not available
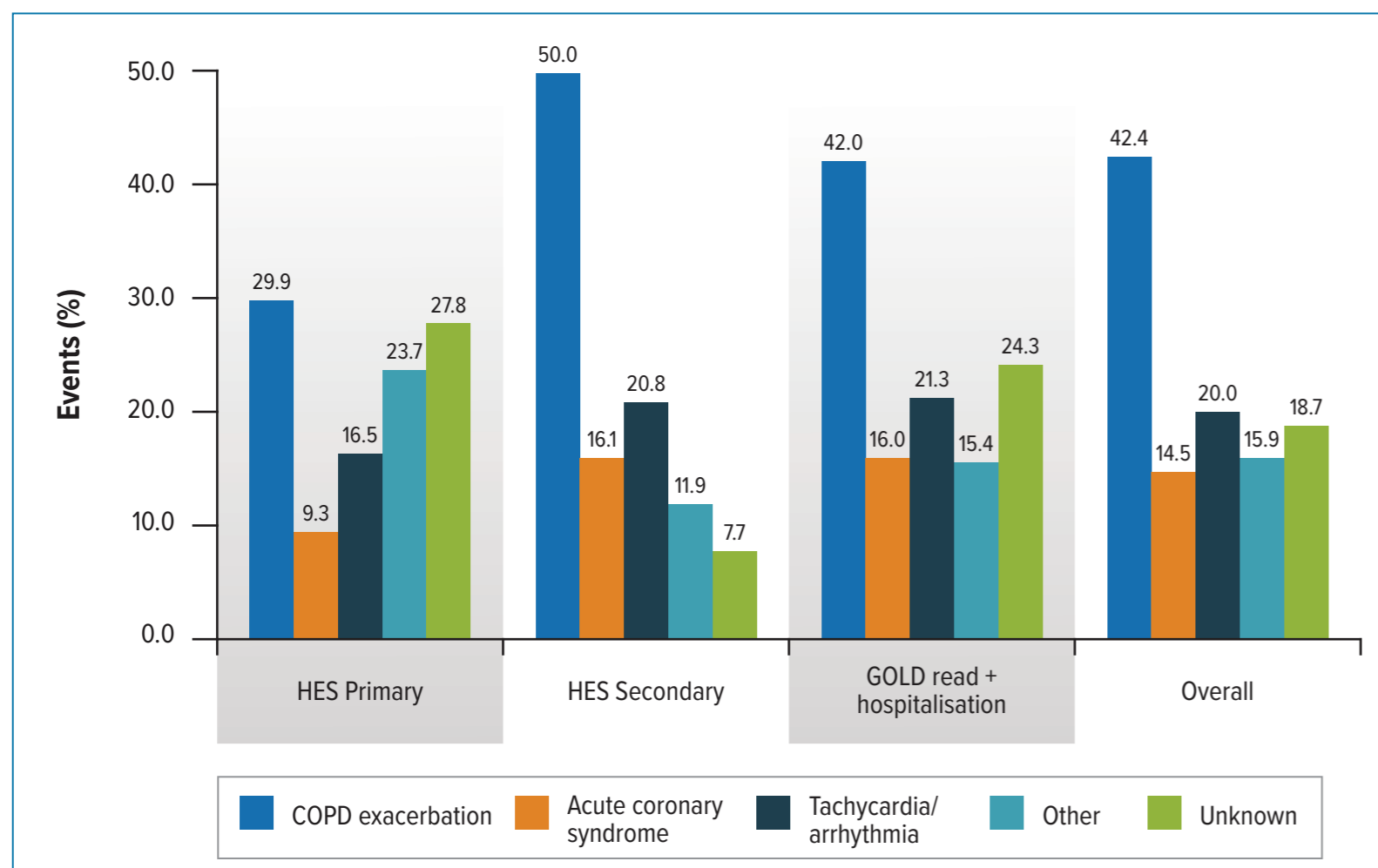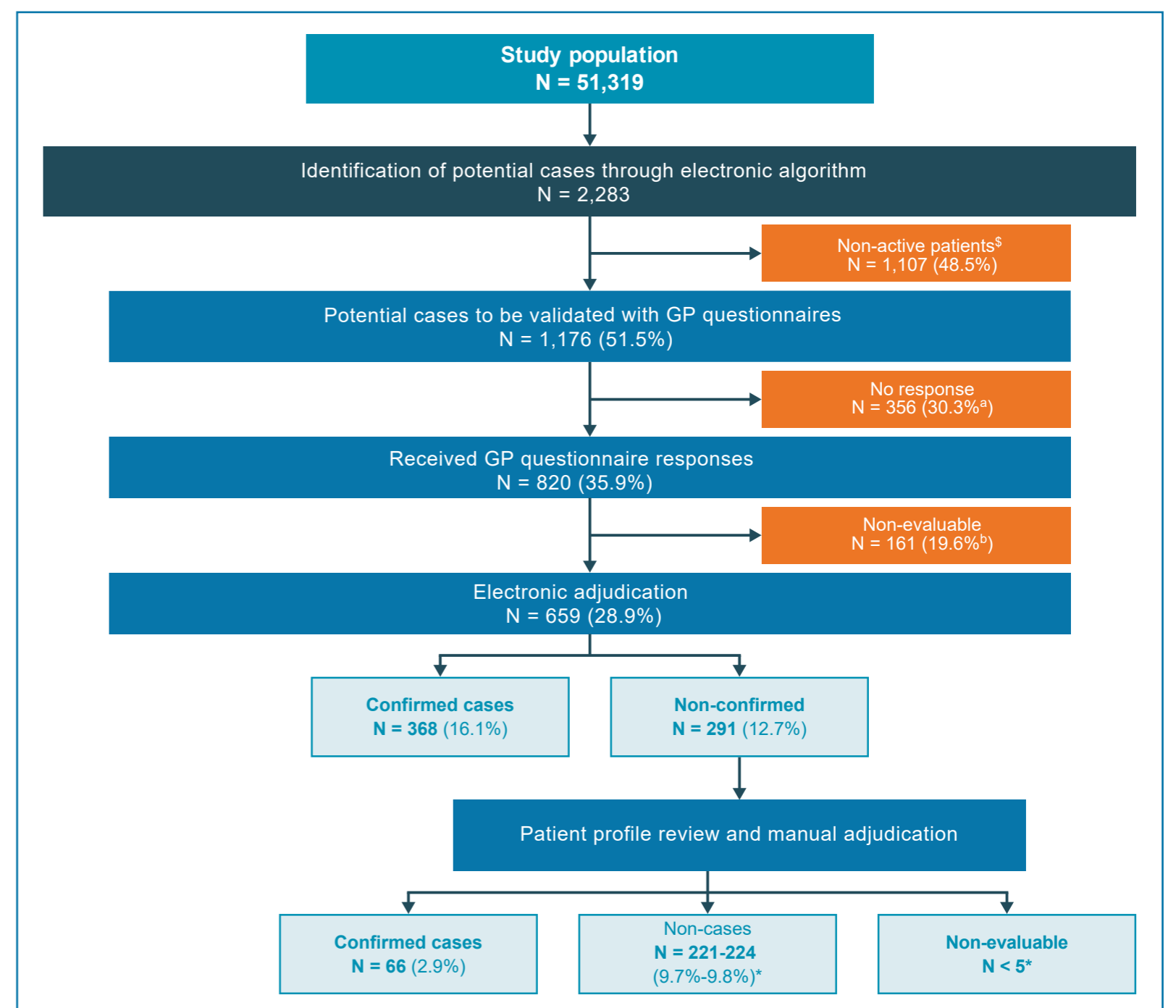
Figure 1. Validation of Potential Cases of Heart Failure in the Clinical Practice Research Datalink

GP = general practitioner.

All % calculated over all potential cases identified except for:

[a] % calculated over potential cases to be validated with the GP questionnaires.

[b] % calculated over the received GP questionnaire responses.

[$] "Non-active patients" may refer to patients who died a while ago, to patients who changed to practices that were not followed in CPRD, or to patients who emigrated. Patients who recently died are still active patients.

[*] To comply with CPRD small cell-count policy, cell counts with n between 1 and 4 and any additional cells that may lead to calculation of a cell count of 1 to 4 are reported as "n < 5," with no % reported. To avoid back calculation, "non-cases" have been replaced by a range.

RESULTS

From the 51,319 individuals with COPD aged ≥ 40 years, 2,283 were identified as potential HF cases. Results are presented below.

Electronic Algorithm Identification Source of Potential Cases Identified and Questionnaires Received

	Potential Cases	All GP Questionnaires Sent[a]		GP Questionnaires Received		GP-Valid Questionnaires					
						All Valid		Confirmed		Non-cases	
	n	n	%[b]	n	%[c]	n	%[c]	n	PPV (%[d])	n	%[e]
Total	2,283	1,176	51.5	820	69.7	656	55.8	434	66.2	221-224*	33.7-34.1*
By electronic algorithm identification source											
HES primary discharge diagnosis	436	194	44.5	129	66.5	102	52.6	97	95.1	5	4.9
HES secondary discharge diagnosis	1,446	666	46.1	441	66.2	350	52.6	168	48.0	182	52.0
GOLD read + hospitalization	401	316	78.8	250	79.1	204	64.6	169	82.8	35	17.2

[a] After CPRD feasibility check (only active patients).

[b] % calculated over potential cases.

[c] % calculated over all GP questionnaires sent.

[d] Positive predictive value (PPV) % calculated over all GP-valid questionnaires.

[*] To comply with CPRD small cell-count policy, cell counts with n between 1 and 4 and any additional cells that may lead to calculation of a cell count of 1 to 4 are reported as "< 5," with no % reported. To avoid back calculation, the total of "non-cases" has been replaced by a range.

Figure 2. Underlying Cause(s) of Acute or Decompensated Heart Failure in Confirmed Cases

CONCLUSIONS

- **Among patients with COPD, the algorithms used to identify hospitalizations for HF through HES primary discharge diagnosis and through GOLD HF diagnosis and hospitalization codes had a high PPV (> 80%).**

- **The algorithm that identified cases through secondary discharge diagnosis had a lower PPV (48.0%) but contributed to a high proportion of the total cases confirmed (38.7%).**

- **Overall, the main cause of acute or decompensated HF in confirmed cases was COPD exacerbation (42.4%) followed by tachycardia/arrhythmia (20.0%).**

REFERENCES

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The power of **knowledge**.
The value of **understanding**.

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