# How to use pharmacy dispensing data to measure adherence and identify nonadherence with oral hypoglycaemic drugs

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# Background

- **Adherence calculations** often based on information of automated **databases**

- Require a number of **methodological choices**.

- **Methodological framework** available to assess adherence with oral hypoglycaemic agents (**OHA**) by health insurance **claims data**.

- **Pharmacy dispensing** data are useful to **identify non-adherent (NA) patients for pharmaceutical care** and **need additional methodological categories**.

# Objective

To examine the influences
of different parameter values
within a framework
expanded for the use of dispensing data
in estimating OHA adherence.

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# Methods

Data were used from the Dutch Foundation of  Pharmaceutical Statistics, SFK.

- Detailed information of dispensed drugs:
  - ATC codes
  - Amount dispensed
  - Prescribed Daily Dose (PDD)
- Patients
  - Anonymous code
  - Sex
  - Year of birth
- Optional: pharmacies with shared population and the same anonymous codes can register as clusters

# Methods

Inclusion of cessation periods
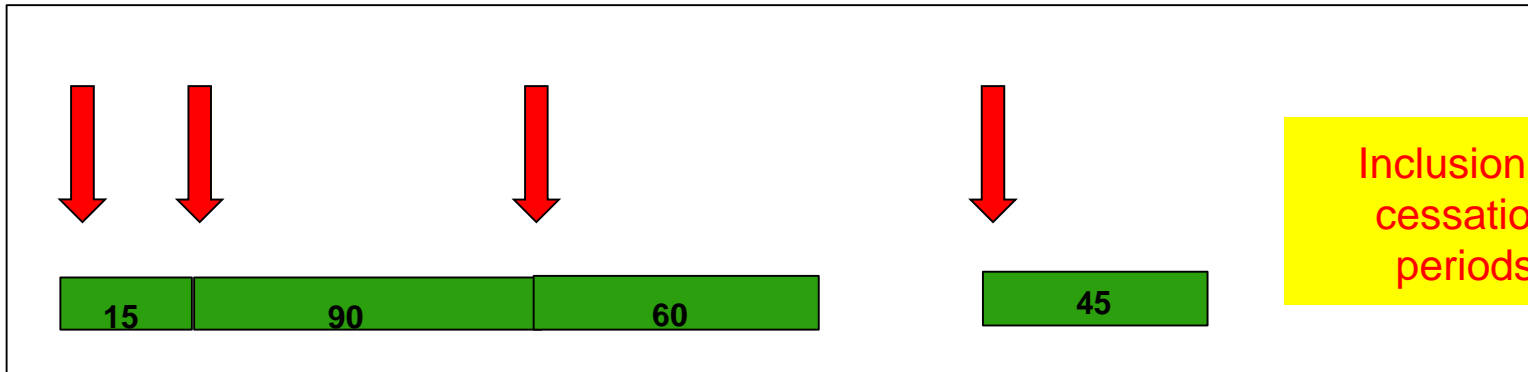
| 15 | 90 | 60 | | 45 |

**Adherence between dispensings:**

= days covered by drug use from the first and the one but last dispensing
  days between the start of the first and the start of the last dispensing

= 15+90+60
  15+90+90

=165/195 =85%

**Dichotomous measure 80%**

'adherent'

'non adherent'

**Adherence until a hypothetical end date:**

= days covered by drug use from all dispensings in the study period
  days from the first dispensing until the eind of the study period

= 15+90+60+45
  15+90+90+160

=210/ 355 =59%

# Methods

1. Patient inclusion by diagnosis, drug prescribing or **dispensing of an OHA drug (ATC class A10B)**

2. Patient type as inclusion criterion: starters, prevalent users or **all OHA users**

3. Minimum number of dispensings as inclusion criterion: at least several dispensings, >**1 OHA dispensing during study period**

4. Length of observation period: some months, **1 year (July 2013 – July 2014)**

5. Calculation of the average medication availability (AMA) : from dispensings, **calculation by the number of dispensed drugs and the prescribed daily dose**

6. Time interval under observation: within dispensings or **until the end of the study period as fixed date (including periods of drug cessation)**

7. Adherence measure: assumption of switching between OHA drug classes or **concomitant use of several OHA drug classes**

8. Stockpiling: not or **well** considered

Wilke T, Groth A, Mueller S, Reese D, Linder R, Ahrens S, et al. How to use pharmacy claims data to measure patient nonadherence? The example of oral diabetics in therapy of type 2 diabetes mellitus. The European Journal of Health Economics 2013;14(3):551-68.

# Methods

9. Dealing with adherence >100% : no or **well** truncation

10. Number of analyzed medication classes: only one OHA or **all OHA classes in use**

11. Patients with absence periods (e.g . hospital stay, holidays):**exclusion**

12. Threshold to calculate the mean rate of adherent patients (MRAP): **MPRAP**60/**80**/90: percentage of patients with an **AMA**>60%/ **>80%** / >90%,

13. 'Drop in' patients (with only 1 dispensing of any drug in a pharmacy): **excluded**

14. 'Non actual patients' (without a dispensing of any drug in the last four months of the study period): **excluded**

15. Insulin users beside OHA use: **included**

16. Source of dispensing data from pharmacy clusters or **individual pharmacies**

Wilke T, Groth A, Mueller S, Reese D, Linder R, Ahrens S, et al. How to use pharmacy claims data to measure patient nonadherence? The example of oral diabetics in therapy of type 2 diabetes mellitus. The European Journal of Health Economics 2013;14(3):551-68.

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# Methods

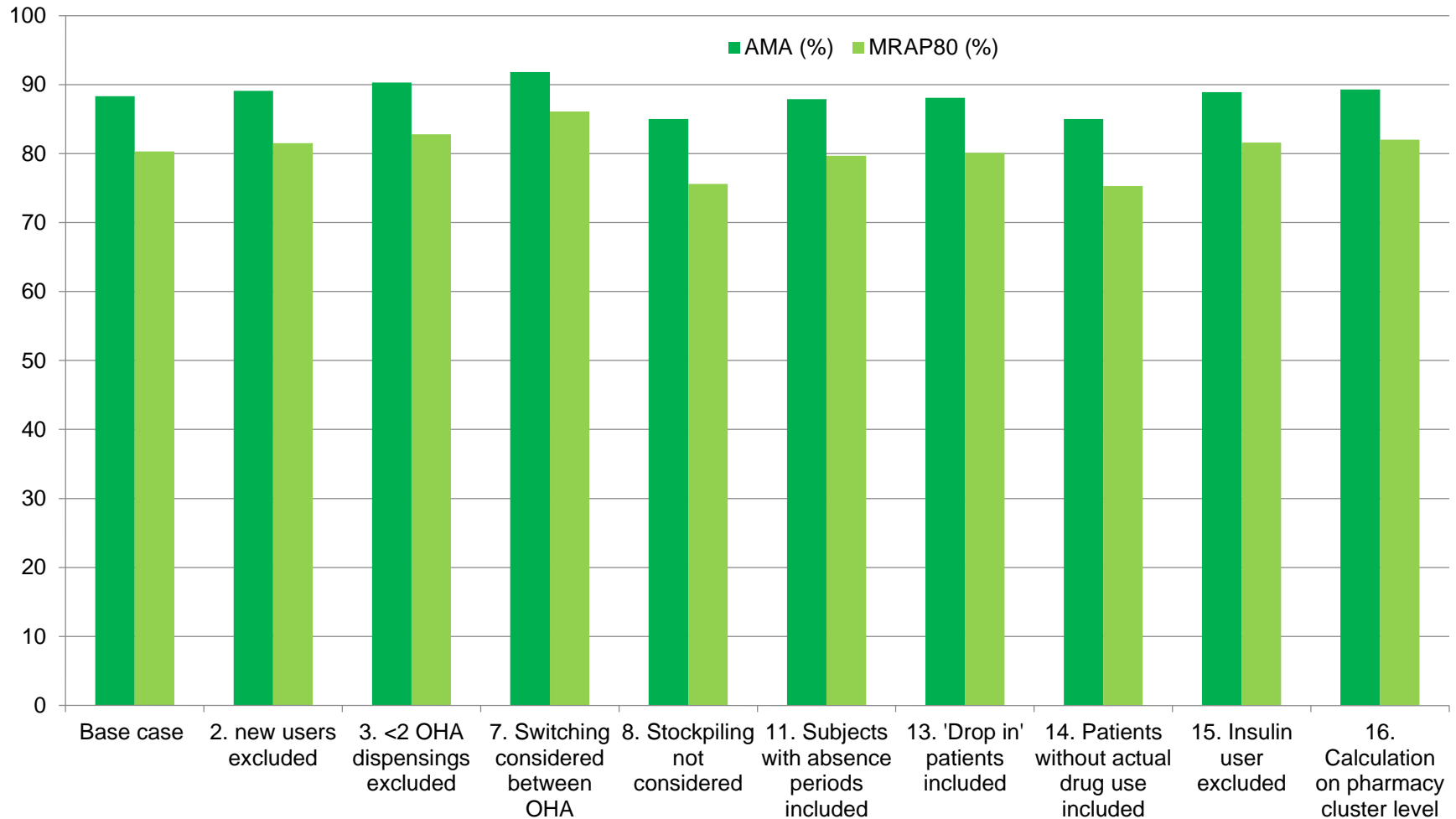The following adherence measures were calculated for OHA use in the study period between July 2013 and July 2014:

1. the average medication availability (AMA )
2. a) the percentage of patients with an AMA ≥ 80% (MRAP80)

   b) the absolute mean number of NA patients per pharmacy.

Consequences from variation on parameter values for the adherence measures were compared to a base case scenario.

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# Results

Data were available for 604,500 OHA users in 1,737 (88%) Dutch community pharmacies.

# Results: Average medication availability (AMA) and percentage of patients with an AMA>80% (MRAP80)



Legend: ■ AMA (%) ■ MRAP80 (%)

Categories (x-axis): Base case; 2. new users excluded; 3. <2 OHA dispensings excluded; 7. Switching considered between OHA; 8. Stockpiling not considered; 11. Subjects with absence periods included; 13. 'Drop in' patients included; 14. Patients without actual drug use included; 15. Insulin user excluded; 16. Calculation on pharmacy cluster level

Base case:
AMA 88.3%
MRAP80: 80,3%

Range of variation
AMA: 85.5% and 91.8%
MRAP80: 75.3% and 86.1%

# Results: the mean number of non-adherent patients per pharmacy
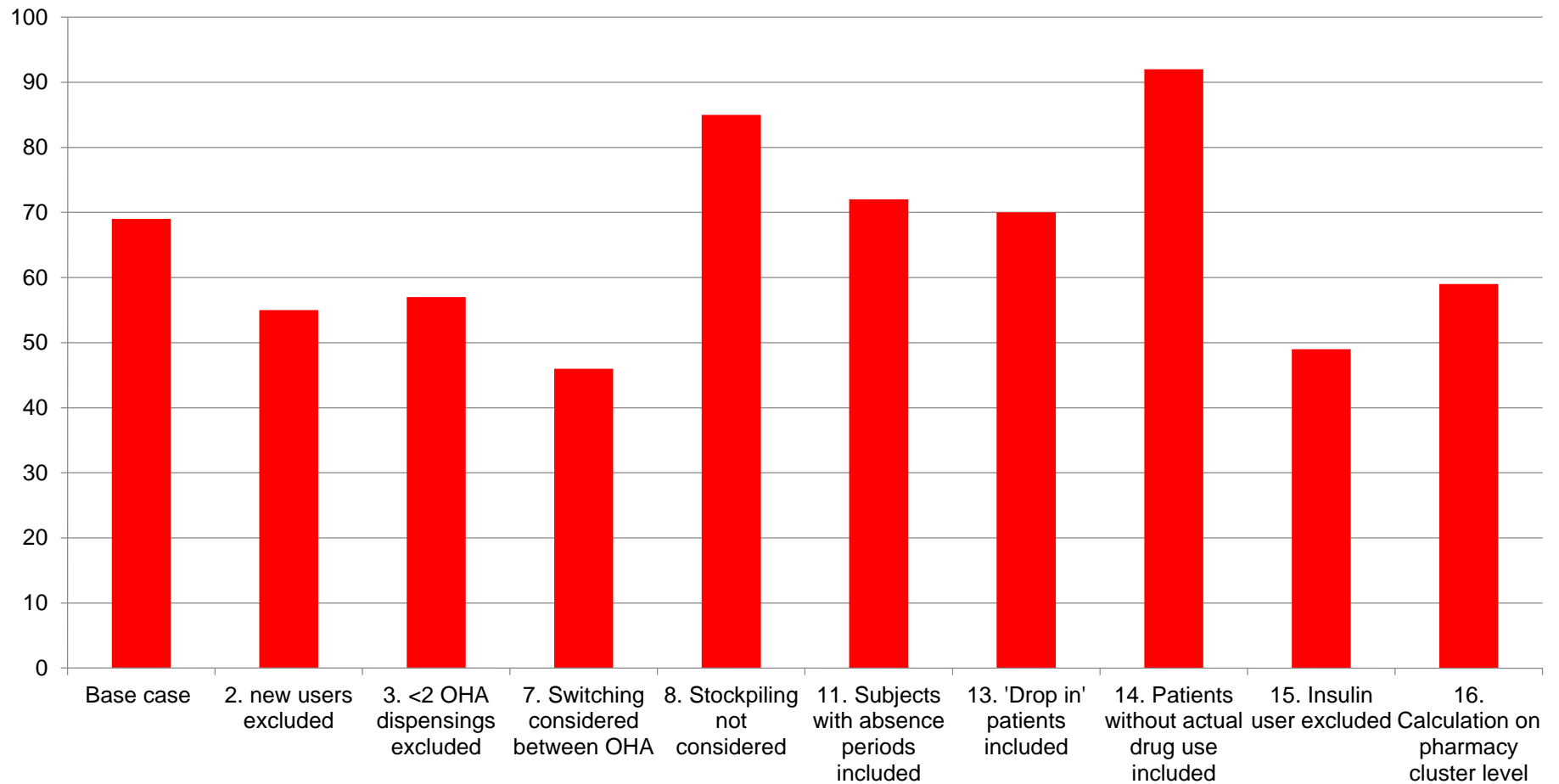


Base case:
Mean number of NA patients / pharmacy: 69

Range of variation: 49 - 92

# Discussion

- Adherence scores in percentages relative robust to variation of parameter values.

- Due to high number of OHA users substantial differences in absolute numbers of NA patients per pharmacy.

- Validation of patients identified as non-adherent is needed in clinical practice.

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# Discussion: base case choices

Include:

- all patients, starters as well as prevalent users
- insuline users
- periods of drug cessation (not only use between dispensing periods)

Exclude:

- 'drop in' patients
- 'non actual patients'

Consider concomitant use of several OHA drug classes instead of switching

If possible, use all patients' dispensings, also from several pharmacies.