Medication Possession Ratio (MPR)

• **What is MPR?**
  – Measure of adherence
  – Ratio of the no. of doses dispensed relative to the dispensing period
  – Measures the (% of) time an individual has possession of medicines
Adherence

• Appropriate consumption of patient medication as prescribed by a healthcare provider (patient driven)

• Why do we measure adherence?
  – Optimal medical care
  – Clinically effective treatments
  – Indicator of chronic use (occasionally)
    (e.g. adherence of >90% per year could possibly indicate chronic use)
Measuring adherence through pharmacy administrative dataset

- Medication possession ratio (MPR)
- Proportion of days covered (PDC)
- Persistence
- Continuous Measure of Medication Acquisition (CMA)
- Continuous Multiple Interval Measure of Oversupply (CMOS)
- Medication Refill Adherence (MRA)
- Continuous Measure of Medication Gaps (CMG)
- Continuous, Single Interval Measure of Medication Acquisition (CSA)
- Refill Compliance Rate (RCR)
- Dates Between Fills Adherence Rate (DBR)
- Compliance Rate (CR)
- Dispensing data/prescription refills
MPS

• How to calculate MPR?
  – Number of days of medication supplied within the dispensing (refill) interval / number of days in dispensing (refill) interval
  – Need at least 2 dispensing (refill) dates

• Fixed MPR (FMPR)
• Variable MPR (VMPR)
MPR cont.

- **FMPR** - the number of days for which prescribed medication was available during the observation year.

- **VMPR** - the number of days for which prescribed medication was available between the first and last refill in the observation year divided by number of days between these refills.
FMPR = \frac{\text{total Rx days of supply}}{\text{fixed interval (365 days)}}

\text{Numerator:}
\sum (\text{Quantity}) = \text{total Quantity}

\text{total Rx days} = \frac{\text{total Quantity}}{\text{Daily Dose}}
FMPR cont.

• **Denominator**
  – Fixed period of time between the 2 dispensing (refill days) such as 365 days.

• FMPR preferred if patient is dispensed medicines on Day 1 and has continued to Day last.
VMPR

\[ \text{VMPR} = \frac{\text{total Rx days of supply}}{\text{last Rx date} - \text{first Rx date} + \text{last Rx days of supply}} \]

OR

\[ \text{VMPR} = \frac{\text{total Rx days of supply} - \text{last Rx days supply}}{\text{last Rx date} - \text{first Rx date}} \]

\textbf{Numerator} – same as for FMPR

\textbf{Denominator} = (Rx date) + (Last Rx supply)
**MPR: dual and triple therapy**

Dual therapy = \[
\frac{\text{total Rx days of supply}}{2} \div \frac{\text{last Rx date} - \text{first Rx date} + \text{last Rx days of supply}}{2}
\]

Triple therapy = \[
\frac{\text{total Rx days of supply}}{3} \div \frac{\text{last Rx date} - \text{first Rx date} + \text{last Rx days of supply}}{3}
\]

• Useful for chronic conditions (CVD, HIV, Diabetes, fixed-dose combination therapies)

Research in Pharmacoepidemiology (RIPE) @ National School of Pharmacy, University of Otago
MPR cont.

• **Continuous measure**
  – Relevance of increasing MPR value and clinical significance (e.g. increase from 75 to 80%)

• **Categorical (Dichotomous)**
  – Has a cut-off value (arbitrary depending on medicines)

• **MPR > 1**
  – Over adherence?
    - overlapping to the next year, multiple dispensing, over use, early refill, change in regimen, etc.
    - truncate?
Some limitations:

- Accuracy of imputed data

- Change in patient regimen (discontinuation, dose change, samples, changes between patient and prescriber, etc.)

- Possession does not guarantee administration (measures the rate of drug acquisition and not drug exposure)

- Assessment of adherence over short time intervals is likely to be imprecise and could bias the MPR upwards (< 90 days)
Thank You