

# Studying Rational Drug Prescribing In Africa – ‘State Of The Art’ And Opportunities For Research And Action

Reflecting on past submitted proposals and preparing for future grant writing

Prof Oliver Van Hecke  
Prof Michael Pather  
Dr Bianca de Sá e Silva  
Prof Em Jan De Maeseneer



DEPARTMENT OF PUBLIC HEALTH  
AND PRIMARY CARE

# WORKSHOP OUTLINE

- Introduction & welcome (OVH)
- Recap (OVH 10 min)
  - Rational Prescribing
  - The WHO Guide to Good Prescribing
- *PROSPER* study – overview of VLIR-UOS proposal and panel feedback (MP 20min )
- Small group discussion in 2 rounds (everyone 30min)
  - the ‘state-of-the-art’: Rational Prescribing and the WHO Guide
  - critical reflections on the proposal and feedback
- Presenting the results of the discussion rounds (everyone 30min)
- Next steps (BdSS and JdM 20min)

# WHAT IS RATIONAL PRESCRIBING?

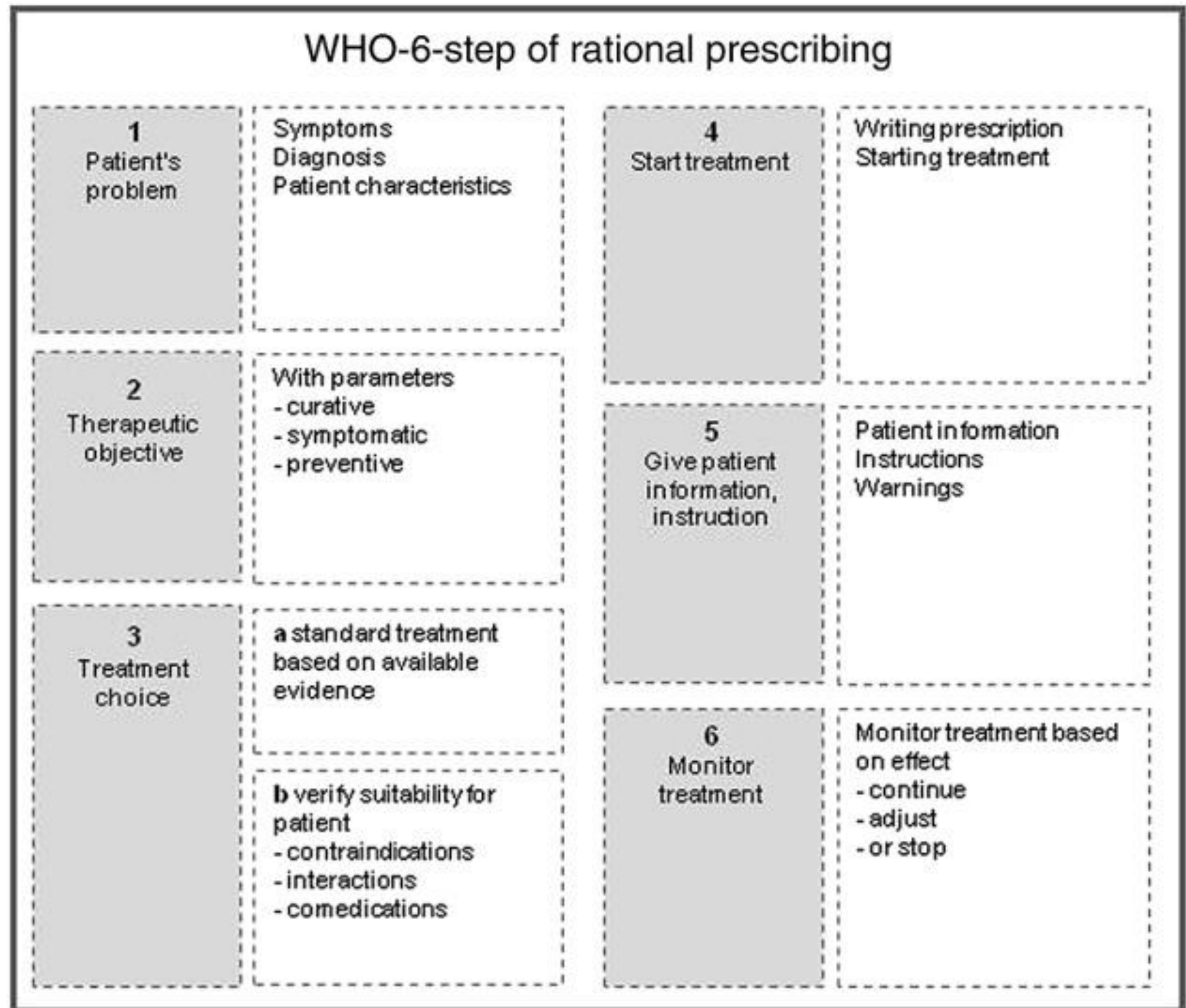
# RATIONAL PRESCRIBING

Rational medicine use requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community

## Reference

World Health Organization, The rational use of drugs: report of the Conference of Experts. Geneva, 1987. <http://www.apps.who.int/medicinedocs/en/m/abstract/Js17054e/>. Accessed 27 Jul 2023.

# SIX STEPS OF RATIONAL PRESCRIBING



# HOW DO WE MEASURE IT?

# WORLD HEALTH ORGANIZATION (WHO)/INTERNATIONAL NETWORK OF RATIONAL USE OF DRUGS (INRUD) STANDARDIZED TOOL

Core drug use indicators include five prescribing indicators

**Table 1** WHO prescribing indicators and recommended reference values [12, 13]

WHO prescribing indicator	Reference value
Average number of medicines per encounter	<2
Percentage of medicines prescribed by generic name	100 %
Percentage of encounters with an antibiotic prescribed	<30 %
Percentage of encounters with an injection prescribed	<20 %
Percentage of medicines prescribed from an essential medicines list or formulary	100 %

# WHY IS RATIONAL PRESCRIBING IMPORTANT?



# RATIONAL- & IRRATIONAL PRESCRIBING

- Reduction morbidity and mortality
- Incr. public confidence, reinforcing health system credibility
- Continued adherence to Rx e.g. chronic illness
- Optimise scarce resources

- Overprescribing medicines
- Incr. risk of adverse drug interactions,
- Incr. dispensing errors
- Incr. medicine expenditure
- Negatively impact the quality of patients' care
- Decr. patients' knowledge of the correct doses of medications
- Polypharmacy - cycle of health demands and costs as new treatments may be required

WHAT (READ *HOW BIG*) IS THE PROBLEM?

‘.... continual suboptimal prescribing in primary care in all regions of the world. Less than half of all patients are treated in accordance with STGs’.

Tropical Medicine and International Health

doi:10.1111/tmi.12123

VOLUME 18 NO 6 PP 656–664 JUNE 2013

## Review

# **Have we improved use of medicines in developing and transitional countries and do we know how to? Two decades of evidence**

**K. A. Holloway<sup>1</sup>, V. Ivanovska<sup>2,3</sup>, A. K. Wagner<sup>4</sup>, C. Vialle-Valentin<sup>4</sup> and D. Ross-Degnan<sup>4</sup>**

## Review

# **Have we improved use of medicines in developing and transitional countries and do we know how to? Two decades of evidence**

K. A. Holloway<sup>1</sup>, V. Ivanovska<sup>2,3</sup>, A. K. Wagner<sup>4</sup>, C. Vialle-Valentin<sup>4</sup> and D. Ross-Degnan<sup>4</sup>

900 studies, 104 countries;

For the African region (1990-2009), global review reported:

- the average number of medicines per patient encounter 2.6 (<2)
- % encounters with antibiotics prescribed as 45.9 %, (<30%)
- % encounters resulting in prescription of injection as 28.4 %, (<20%)
- % medicines prescribed from EML to be 89 %, (100%)
- % medicines prescribed in generic name as 65.1 % (100%)

# ‘Prescribing indicators for the African region deviate significantly from the WHO reference targets’

Ofori-Asenso *et al. BMC Public Health* (2016) 16:724  
DOI 10.1186/s12889-016-3428-8

BMC Public Health

RESEARCH ARTICLE

Open Access



## Prescribing indicators at primary health care centers within the WHO African region: a systematic analysis (1995–2015)

Richard Ofori-Asenso<sup>1\*</sup>, Petra Brhlikova<sup>2</sup> and Allyson M. Pollock<sup>2</sup>

RESEARCH ARTICLE

Open Access



# Prescribing indicators at primary health care centers within the WHO African region: a systematic analysis (1995–2015)

Richard Ofori-Asenso<sup>1\*</sup>, Petra Brhlikova<sup>2</sup> and Allyson M. Pollock<sup>2</sup>

43 studies, 11 countries;  
141,323 patient encounters,  
572 primary care facilities

## Review specific for African WHO region:

- average number of medicines prescribed per patient encounter 3.1 (IQR 2.3–4.8)
- % medicines prescribed by generic name 68.0 % (IQR 55.4–80.3)
- % encounters with antibiotic prescribed 46.8 % (IQR 33.7–62.8)
- % encounters with injection prescribed 25.0 % (IQR 18.7–39.5)
- % medicines prescribed from essential medicines list 88.0 % (IQR 76.3–94.1)



# Implications of the South African National Drug Policy on prescribing patterns: a case study of the Limpopo province

Onyinye Onyeka Akunne<sup>1\*</sup>, Vutomi Valoyi<sup>2</sup>, Alexander Wehmeyer<sup>2</sup>, Yasmina Johnson<sup>3</sup> and Renier Coetzee<sup>1</sup>

**Table 3** Medicines prescription patterns in selected South African provinces over time

WHO prescribing indicator	Limpopo Oct–Dec 2018*	Limpopo Aug–Dec 2005**	Western Cape Aug–Dec 2005**
The average number of medicines per encounter	4.3	3.4	3.0
% Medicines prescribed by generic name	43%	41.7%	48.6%
% Encounters with an antibiotic prescribed	28%	63.4%	72.8%
% Encounters with an injection prescribed	8%	9.8%	6.7%
% Medicines prescribed from an essential medicines list or formulary	90%	93.1%	92.0%

\*Study value; \*\*Data from public healthcare clinics[5]



‘We assume the African region is homogenous. Although there are differences in disease burden, health system challenges, socio-cultural and political climates across countries which all can affect how medicines are used’.

**Table 4** Comparison of medicines prescription patterns across three African Countries

WHO prescribing indicator	South Africa Oct–Dec 2018*	Ethiopia Jan 2017–June 2019**	Eritrea Sept 2017–Jan 2018***
The average number of medicines per encounter	4.3	1.7	1.8
% Medicines prescribed by generic name	43%	95.6%	94.9%
% Encounters with an antibiotic prescribed	28%	58.2%	54.5%
% Encounters with an injection prescribed	8%	15.9%	6.6%
% Medicines prescribed from an essential medicines list or formulary	90%	93.9%	94.8%

\*Study values, \*\*Tassew et al. 2021[11], \*\*\*Siele et al. 2022[10]



# WORKSHOP OUTLINE

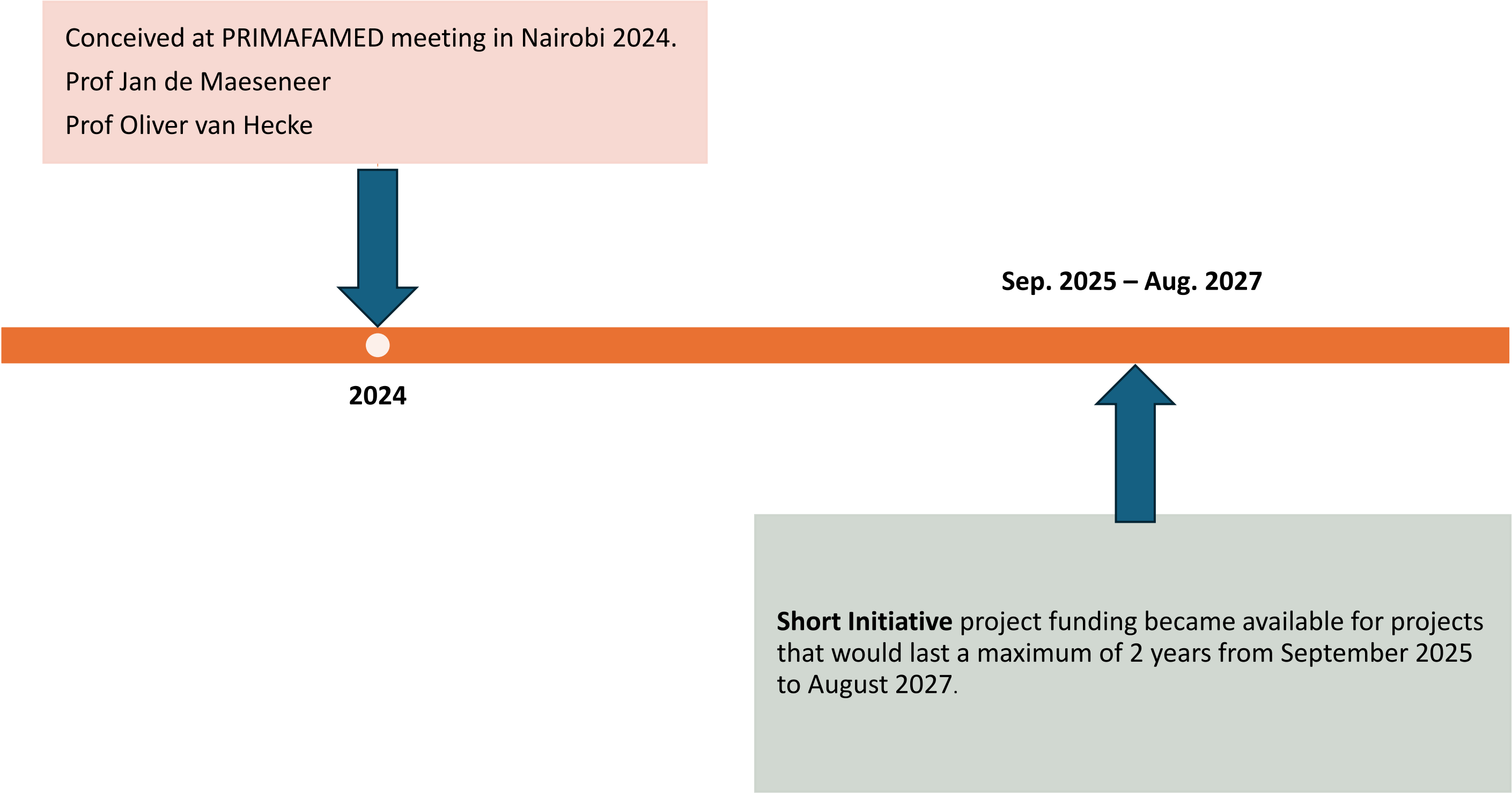
- Introduction & welcome (OVH)
- Recap (OVH 10 min)
  - Rational Prescribing
  - The WHO Guide to Good Prescribing
- ***PROSPER* study – overview of VLIR-UOS proposal and panel feedback (MP 20min )**
- Small group discussion in 2 rounds (everyone 30min)
  - the ‘state-of-the-art’: Rational Prescribing and the WHO Guide
  - critical reflections on the proposal and feedback
- Presenting the results of the discussion rounds (everyone 30min)
- Next steps (BdSS and JdM 20min)

# Promoting Rational Medicine Prescribing in Primary Care across sub-Saharan Africa (PROSPER)



- Prof Oliver Van Hecke
- Dr Bianca de Sá e Silva
- Prof Em Jan De Maeseneer
- **Prof Michael Pather**

# Overview of PROSPER



# Partnership – (leave no one behind)

**With Five diverse Higher Education Institutions.**

- Ghent University (Ellen Van Leeuwen; Oliver Van Hecke; Bianca Silva)

## **Partner institutions:**

- Stellenbosch University (Michael Pather and Roland van Rensburg)
  - with stronger infrastructure and capacity,
  - where Rational Prescribing has become a priority in both under and postgraduate education.
- Makerere University (Jane Namatova and Innocent Besigye)
- Protestant University of Congo (Jean-Pierre Fina)
- University of Addis Ababa (Meseret Zerihun)



# Rationale

- Medication errors harm patients, increase costs and lead to poor quality of care.
- Critical in SSA where resources are scarce and particularly in primary care where the vast majority of all medicine prescribing occurs.
  - **Medication errors disproportionately affect SSA**
- WHO 6-step Guide to Good Prescribing has positive short- and long-term effects on prescribing practices in Europe.
  - **It is not used in prescriber education across Africa.**
- PROSPER project aligns with the UN Agenda 2030 and the Sustainable Development Goals (SDGs), particularly:
  - SDG 3 (Good Health and Well-being)
  - SDG 12 (Responsible Consumption and Production).
- Research shows that embedding the WHO 6-Step Model in medical training improves prescribing practices, enhances patient safety with better health outcomes and at lower cost.
  - **This approach does not exist across Africa.**



# Promoting rational prescribing practices will:



## Improve Patient Safety:

Up to half of all patient harm in health systems is related to medications and medication errors.

The WHO has launched the third Global Patient Safety Challenge as:

**“Medication without harm”.**



## Optimise Healthcare Costs:

Irrational prescribing leads to increased healthcare costs due to the unnecessary use of expensive medications and the **treatment of avoidable adverse drug reactions**.



## Improve Healthcare Quality:

There is a need to improve the quality of healthcare by **ensuring that prescribing practices are evidence-based and aligned with international guidelines** (Niaz et al., 2019).



## Minimise Environmental harm:

Health systems have a substantial carbon footprint and a large proportion of this is from medication as part of the extra supply chain and from choices in prescribing. Rational procurement and prescribing that also considers environmental **factors can reduce the carbon footprint of health systems**.

# PROSPER



Aim



To inform the implementation of the WHO Guide in prescriber education in SSA

# Research intentions



1. **Scoping Review:**
  - To appraise the evidence on rational prescribing in African primary care
2. **Horizon Scan and networking:**
  - To strengthen South-South partnerships to embed and sustain prescribing initiatives
  - To identify and engage organisations working on rational prescribing and evidence-based medicine

in Africa to create an ecosystem where key stakeholders (academic and non-academic) facilitate

the promotion and uptake of rational medicine prescribing at local and regional level.
3. **Webinars and Bulletins**
  - To upskill local educators and prescribers on rational prescribing .
4. **Conference presentations, workshops on rational prescribing led by partners at:**
  - WONCA Regional Conference in Gabarone, Botswana, Sept 2026
  - Southern African Health Educators (SAAHE), venue tbc, Jul 2027 .
5. **Support for the PHCFM series on rational prescribing**
  - *(Therapeutic letters)*. .
  - These are edited for the context, while retaining the evidence and recommendations.
  - There are no such bulletins tailored to the African context.
  - Have already published 3. Intention to publish 4 per annum in AJPC&FM



# Research intentions continued

**To evaluate context-relevant implementation strategies of the WHO Guide in prescriber education at four diverse African medical schools**

- Implementation research using **convergent mixed methods** and the **RE-AIM** conceptual framework for implementation outcomes (Reach, Effects, Adoption, Implementation, Maintenance)
- Each of the 4 partners will **design, develop, and implement** educational activities with under- and post-graduate students using the 6-steps approach.
- The European Prescribing Exam and other resources will be made available to participants.
- Quantitative data will be collected to measure the reach (number of students), the costs (incremental and opportunity) and effects (change in knowledge and skills). Data will be analysed descriptively.
- Qualitative data will be collected to explore the educational design of the intervention, the barriers and enablers to implementation (determinants), the strategies used to implement, and some of the outcomes (issues with adoption, implementation and maintenance of the intervention). Data will be collected via a series of structured focus group interviews with students and key informant interviews with staff. These will initially be held separate in each country, with a final focus group with all countries.
- The quantitative and qualitative data will be **triangulated** and the findings summarised in an implementation research logic model for each country. A synthesis of the findings can then be conducted to compare and contrast the findings from the four countries.
- Findings will be disseminated in a report for policymakers (e.g. WHO) and published in a scientific journal.

<b>Research programmes &amp; methods</b>	<b>Conduct a Scoping review on the question “what is the current evidence on rational prescribing in African primary care?”</b>	<b>Michael Pather</b>
<b>Networks &amp; partnerships</b>	Perform a Horizon Scan of organizations working on rational prescribing and evidence-based medicine in Africa to systematically detect potentially important developments and bring experts across different subject areas together.	Roland Van Rensburg
<b>Educational programmes &amp; methods</b>	Webinars on rational prescribing, short e-course	Bob Mash / Ellen Van Leeuwen
<b>Networks &amp; partnerships</b>	Conference presentations, workshops on rational prescribing	Oliver Van Hecke
<b>Outreach &amp; policy support</b>	Support for the PHCFM series on rational prescribing / therapeutic letters.	Michael Pather, Roland Van Rensburg, Bob Mash
<b>Educational programmes &amp; methods</b>	Implement the 6-steps WHO Guide to Good Prescribing for rational prescribing across four African partner sites.	Ellen/Oliver + Roland/Michael + Jane/Innocent +Jean-Pierre + Meseret

# VLIRUOS panel feedback

---

## Positives

---

Well-conceived, well designed

---

Addresses a critical gap in African medical education

---

Its potential benefits span health, economic and environmental outcomes

---

The link to the theory of change and expected results is clearly articulated

---

Aligns well with key SDGs (especially 3 and 12)

---

Offers a timely application of the WHO: 6 Step Guide to Good Prescribing

---

It builds coherently on previous VLIRUOS and related initiatives

---

Shows potential and reached all the quality standards

---

# VLIRUOS panel feedback (continued)


## Positives

- Represents a solid and sound methodology
- Employs a sound mixed-method approach that combines qualitative and quantitative analysis, which allows for comprehensive understanding
- with strong stake holder engagement of the challenges and promotes interdisciplinary collaboration
- Clear potential for health and policy impact
- It identifies a broad and well-established network of non-academic stakeholders, enhancing the prospects for uptake and policy influence
- The outlined strategies for transfer and engagement are feasible and appropriate
- Fundable!

# FEEDBACK FROM VLIRUOS:

## Reasons for PROSPER SI application being unsuccessful

### Challenges:

- 
- Greater clarity is needed on partner roles and how all partners contribute to decision making and activity design
  - While SU plays a central coordinating role, other African institutions (Makerere, Adis Ababa, Protestant University of Congo appear confined to implementation.
  - Strengthening their involvement in co-leadership and project direction is advised.
  - The sustainability plan relies largely on networks and prospective funding with limited clarity on how reforms will be embedded within institutions to ensure long-term impact.
  - The train-the-trainer approach is promising but would benefit from clearer strategies for embedding long term educational change within partner institutions.
  - Reliance on external tools, such as the European Prescribing Exam and the Canadian Therapeutic Letters may **limit contextual relevance**.
  - The emphasis on academic outputs could detract from practical impacts at community and policy levels.
  - **A balance between academic and practical outcomes** would strengthen its sustainability and systemic influence

### ? Therefore:

- Unfortunately, PROSPER did not reach the cut-off and remained outside of the selection range!

# Final VLIRUOS overall scores

	Relevance	Quality	Implementation	Impact and sustainability
Total definitive scores	A	B	B	B

# WORKSHOP OUTLINE

- Introduction & welcome (OVH)
- Recap (OVH 10 min)
  - Rational Prescribing
  - The WHO Guide to Good Prescribing
- *PROSPER* study – overview of VLIR-UOS proposal and panel feedback (MP 20min )
- **Small group discussion in 2 rounds (everyone 30min)**
  - the ‘state-of-the-art’: Rational Prescribing and the WHO Guide
  - critical reflections on the proposal and feedback
- Presenting the results of the discussion rounds (everyone 30min)
- Next steps (BdSS and JdM 20min)

# Discussion on

? The way  
forward for  
future  
applications

Next 30 minutes:

Small group discussion in 2 rounds:

- The 'state-of-the-art': rational prescribing and the WHO guide
  - What are the issues related with teaching rational drug use?
  - What are the good examples?
- Critical reflections on the proposal **and** the feedback



# WORKSHOP OUTLINE

- Introduction & welcome (OVH)
- Recap (OVH 10 min)
  - Rational Prescribing
  - The WHO Guide to Good Prescribing
- *PROSPER* study – overview of VLIR-UOS proposal and panel feedback (MP 20min )
- Small group discussion in 2 rounds (everyone 30min)
  - the ‘state-of-the-art’: Rational Prescribing and the WHO Guide
  - critical reflections on the proposal and feedback
- **Presenting the results of the discussion rounds (everyone 30min)**

# DISCUSSION

# WORKSHOP OUTLINE

- Introduction & welcome (OVH)
- Recap (OVH 10 min)
  - Rational Prescribing
  - The WHO Guide to Good Prescribing
- *PROSPER* study – overview of VLIR-UOS proposal and panel feedback (MP 20min )
- Small group discussion in 2 rounds (everyone 30min)
  - the ‘state-of-the-art’: Rational Prescribing and the WHO Guide
  - critical reflections on the proposal and feedback
- Presenting the results of the discussion rounds (everyone 30min)
- Next steps (BdSS and JdM **20min**)
  - The Lancet Commission Editorial on Updating the Essential Drugs List (EDL)
  - Future funding calls

# Accelerating progress on essential medicines: a new *Lancet* Commission



There is no equity in access to basic health care. The latest biennial report on universal health coverage reported that in 2021 4.5 billion people—about half the world's population—had no access to basic health pandemic of non-communicable diseases prematurely killed nearly 43 million people in low-income and middle-income countries (LMICs) in 2021.<sup>4</sup> Finally, there is an absence of country-level and suitably

Published Online  
May 21, 2025  
[https://doi.org/10.1016/S0140-6736\(25\)01026-8](https://doi.org/10.1016/S0140-6736(25)01026-8)

# Where to go next: funding opportunities



## Horizon Europe

- Large consortiums, highly competitive
- Calls with specific goals and criteria

# Where to go next: funding opportunities



## VLIRUOS

- Small list of countries
- Different types of funding, for short-, medium- or longer-term projects



# Where to go next: other possibilities?





# Conclusion



Rational prescribing of medicines is a highly relevant topic for Africa



There is intention to collaborate



Resubmit an (updated) proposal



Prof. Oliver Van Hecke – [oliver.vanhecke@ugent.be](mailto:oliver.vanhecke@ugent.be)

Prof. Em. Jan De Maeseneer – [jan.demaeseneer@ugent.be](mailto:jan.demaeseneer@ugent.be)

Prof. Michael Pather - [mpather@sun.ac.za](mailto:mpather@sun.ac.za)

Bianca de Sá e Silva – [bianca.silva@ugent.be](mailto:bianca.silva@ugent.be)

WHO Collaborating Centre on Family Medicine and  
Primary Health Care

Ghent University Department of Public Health and  
Primary Care

Stellenbosch University