Treatment adherence research

Line Guénette, PhD
Sophie Lauzier, PhD
Jocelyne Moisan, PhD
Jean-Pierre Grégoire, PhD
Gabriel Giguère, MSc candidate
Amine Amiche, MSc candidate
Hervé Zomahoun, PhD candidate

Faculty of pharmacy, Laval University, Quebec, QC, Canada
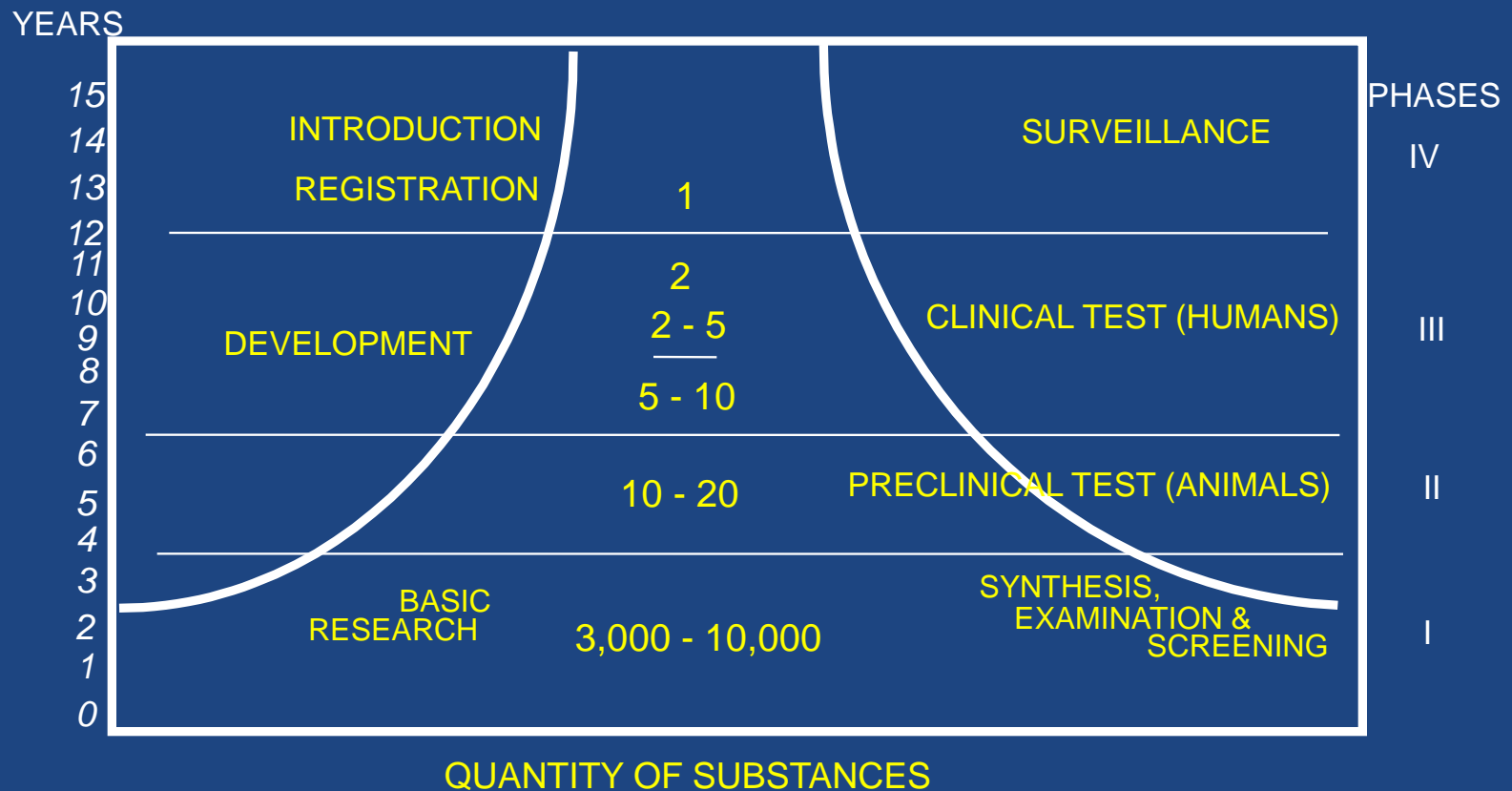**Chair on adherence to treatments, Laval Universisty, Quebec, QC, Canada**
Unité de recherche en santé des populations, Centre de recherche FQR-S du Centre hospitalier *affilié*
universitaire de Québec, QC, Canada.

UNIVERSITÉ LAVAL

Chaire sur l'adhésion aux traitements

Drug development phases

YEARS

PHASES

15
14   INTRODUCTION   SURVEILLANCE   IV
13   REGISTRATION   1
12
11   2
10   2 - 5   CLINICAL TEST (HUMANS)   III
9   DEVELOPMENT
8   5 - 10
7
6   PRECLINICAL TEST (ANIMALS)   II
5   10 - 20
4
3   BASIC   SYNTHESIS,
2   RESEARCH   3,000 - 10,000   EXAMINATION &   I
1   SCREENING
0

QUANTITY OF SUBSTANCES

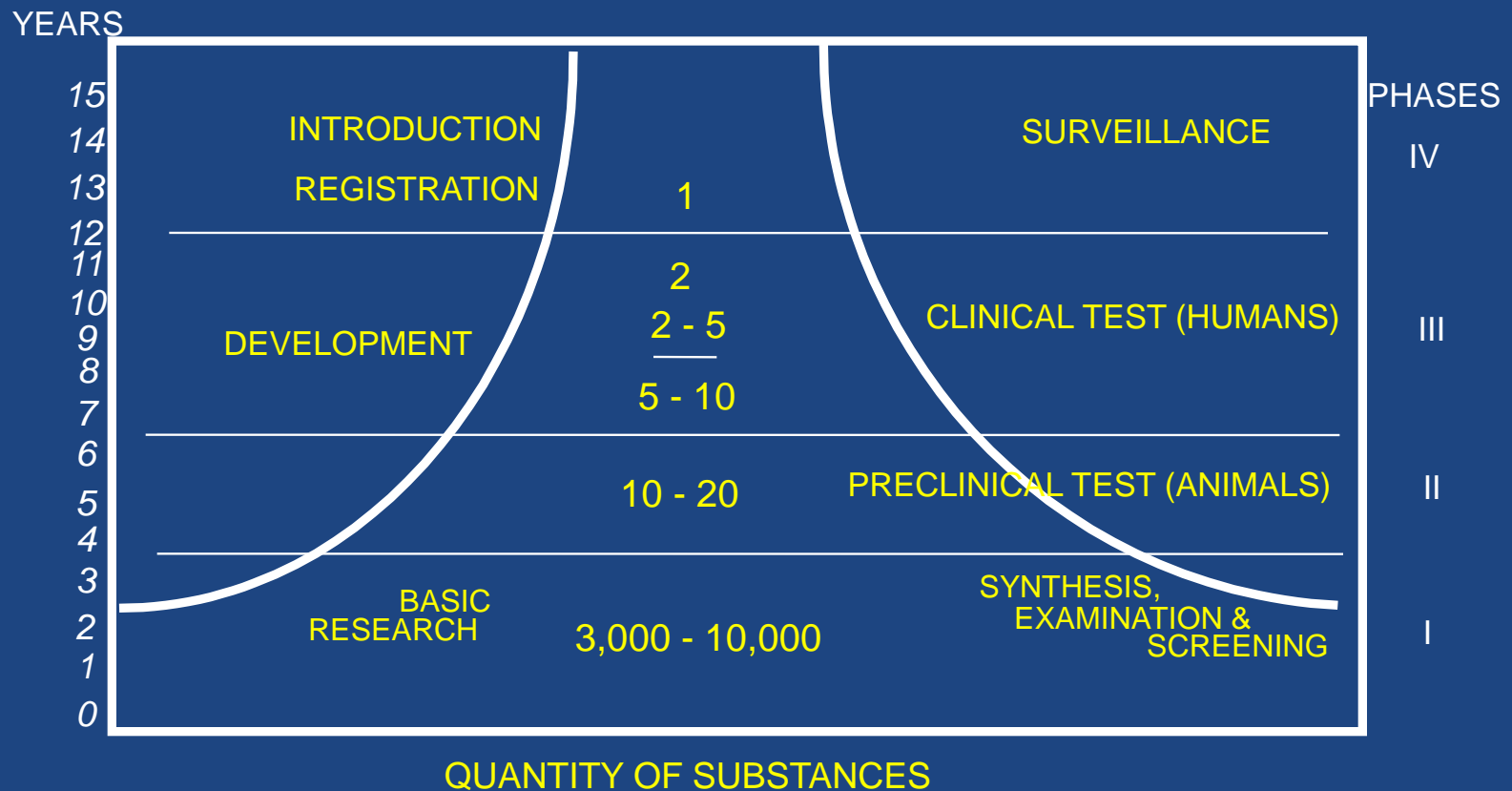*Source: Based on PhRMA, updated for data per Tufts Center for the Study of Drug Development (CSDD) database.*
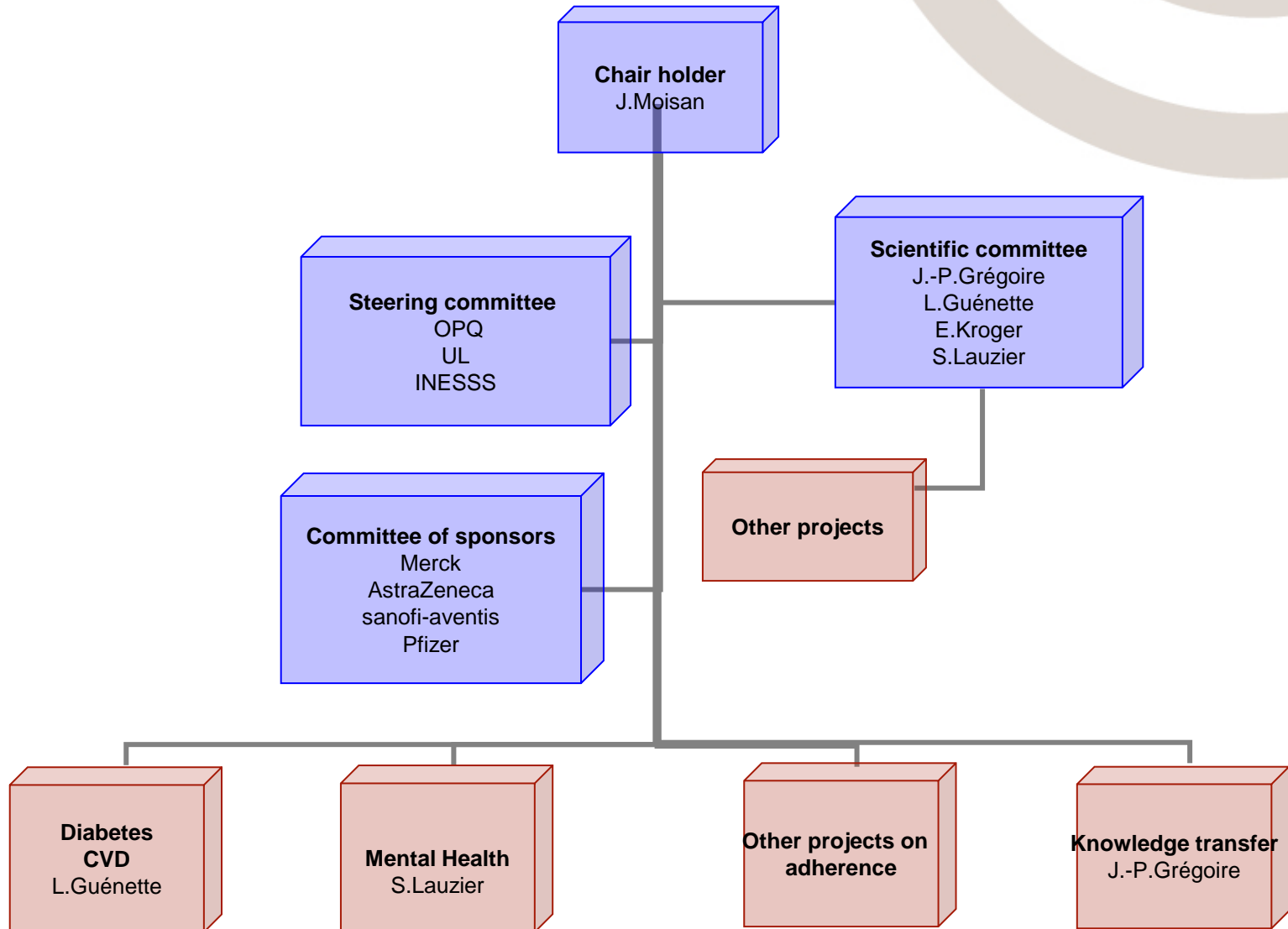
Drug development phases

Source: Based on PhRMA, updated for data per Tufts Center for the Study of Drug Development (CSDD) database.

Laval's Chair on adherence to treatments

Organisational flow chart

Purpose of the Chair

- Contribute to population health by proposing effective means to improve adherence.

- This goal will be achieved by means of:
  - Research projects
  - Knowledge transfer activities
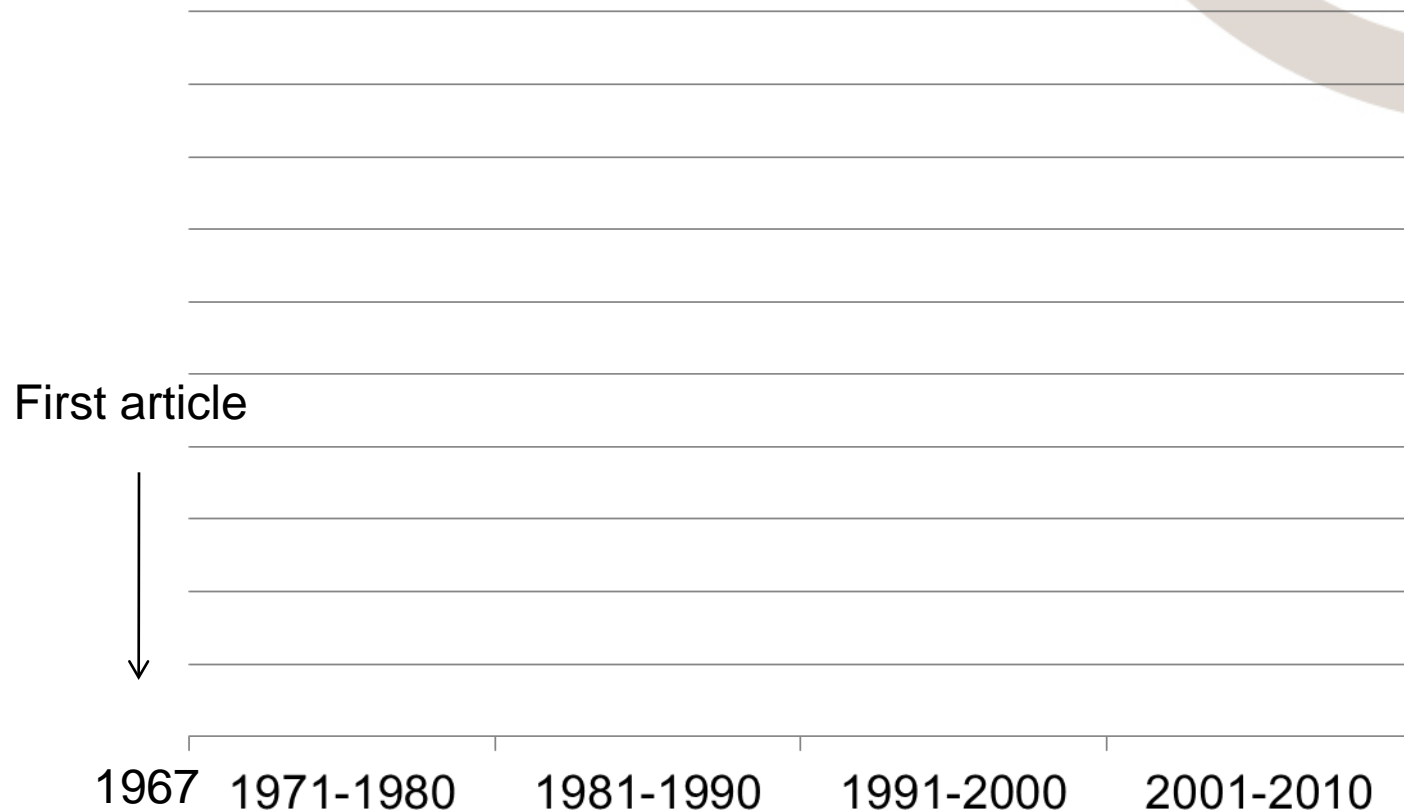 - And also by increasing research capacity in the field of adherence

Acknowledgment

45 years of research on treatment adherence

First article

1967 1971-1980 1981-1990 1991-2000 2001-2010

**PubMed numbers for search strategy
« Patient compliance AND drug therapy »**

45 years of research on treatment adherence

14958

First article
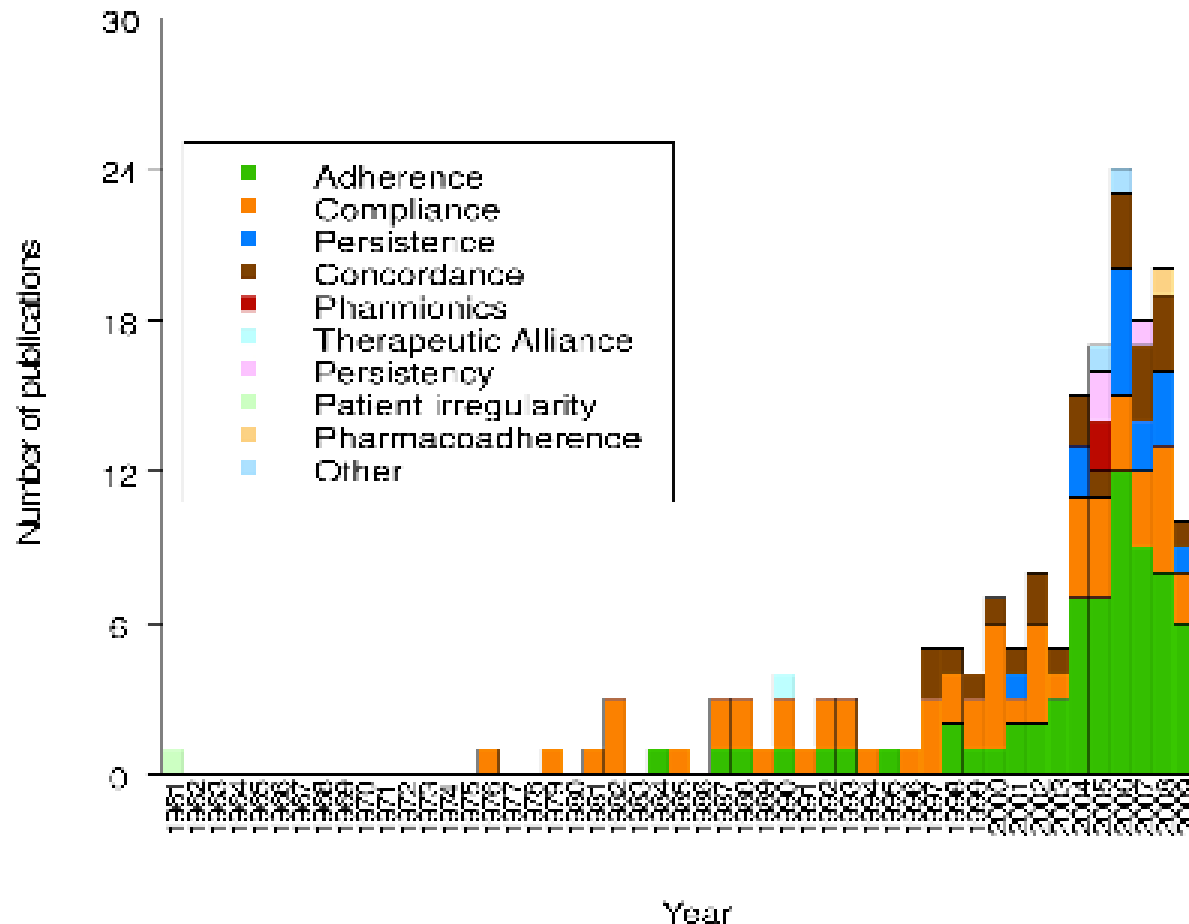
5987

3097

904

1967 1971-1980   1981-1990   1991-2000   2001-2010
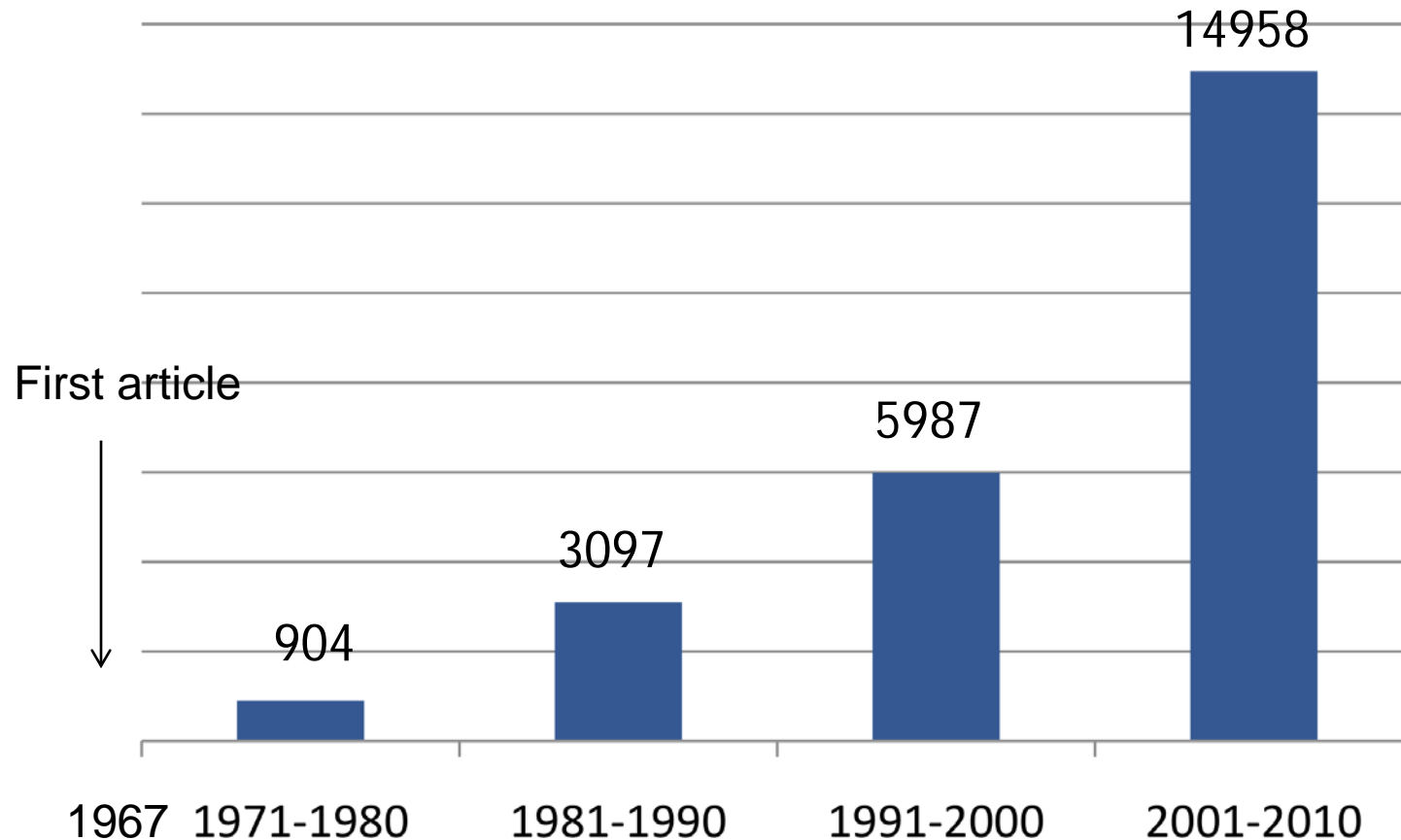
PubMed numbers for search strategy
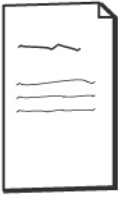**« Patient compliance AND drug therapy »**

A definition

- the extend to which patient's behavior coincides with healthcare professional's advice
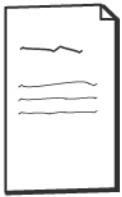
Taxonomy over the years

Source: Vrijens *et al.*, 2012. A new taxonomy for describing and defining adherence to medications
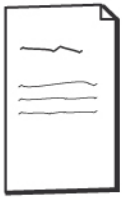
Prescription

Prescription

Pharmacy visit

**Initial acquisition
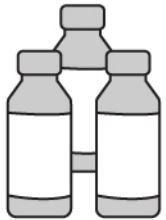of drug**

ACCEPTATION

Prescription

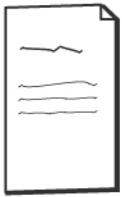Pharmacy visit

Initial acquisition of drug

Pharmacy visit

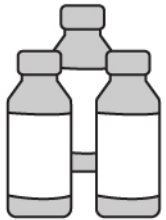**Subsequent acquisitions of drug**

ACCEPTATION

PERSISTENCE

Prescription

Pharmacy visit

Initial acquisition of drug

Pharmacy visit

Subsequent acquisitions of drug

All doses taken in accordance with healthcare professional recommendations

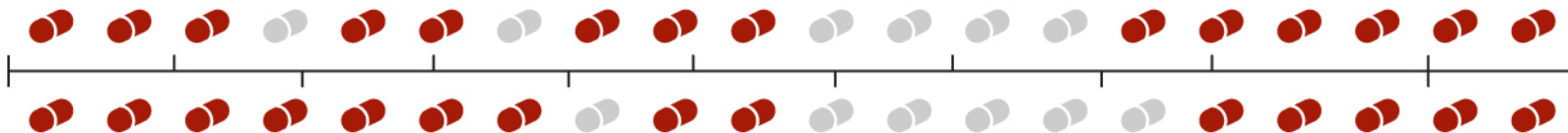*ACCEPTATION*   *PERSISTENCE*   *COMPLIANCE*

Adherence

Adherence

Acceptation

Adherence

Persistence

Persistence

Adherence

Compliance

Persistence

Persistence

Adherence

Compliance

Compliance
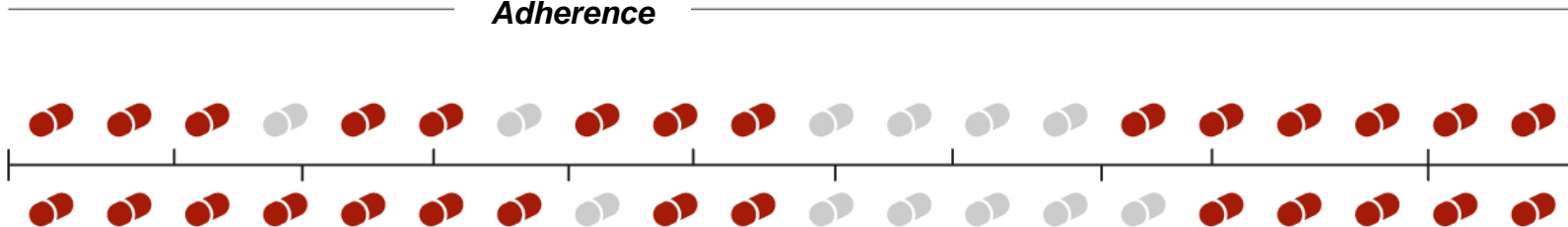
Acceptation

Persistence

Persistence
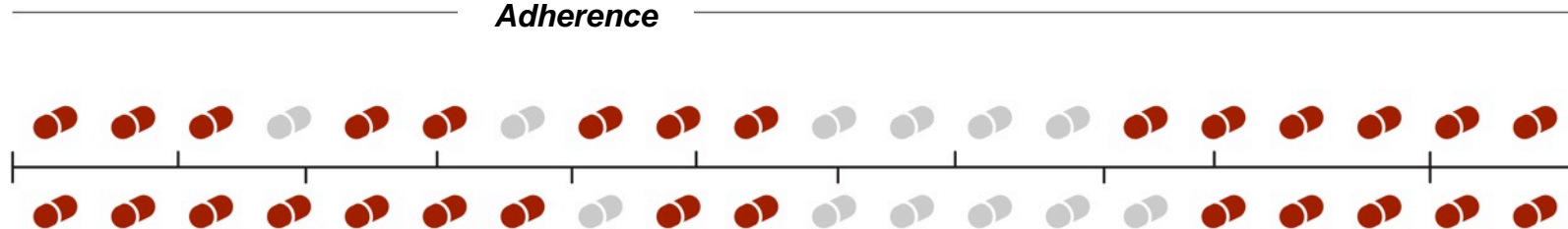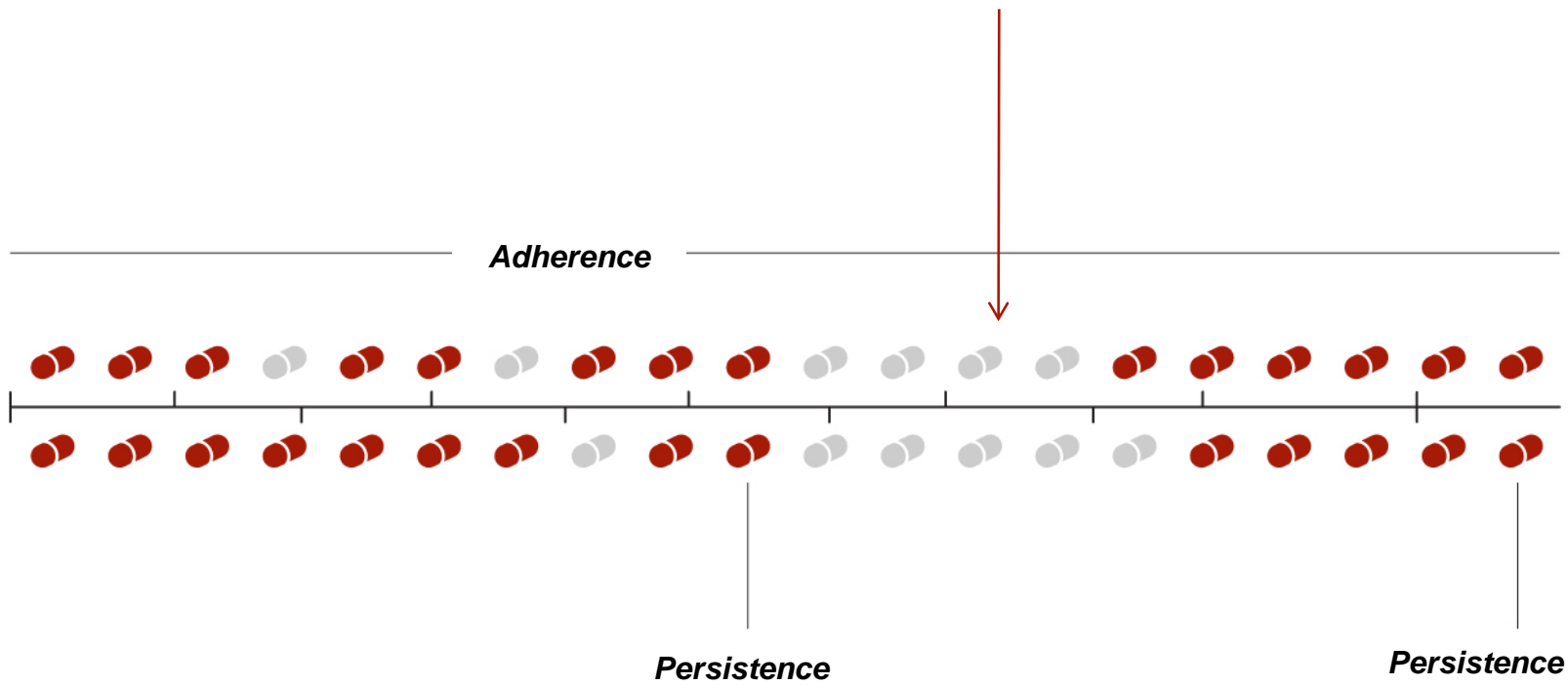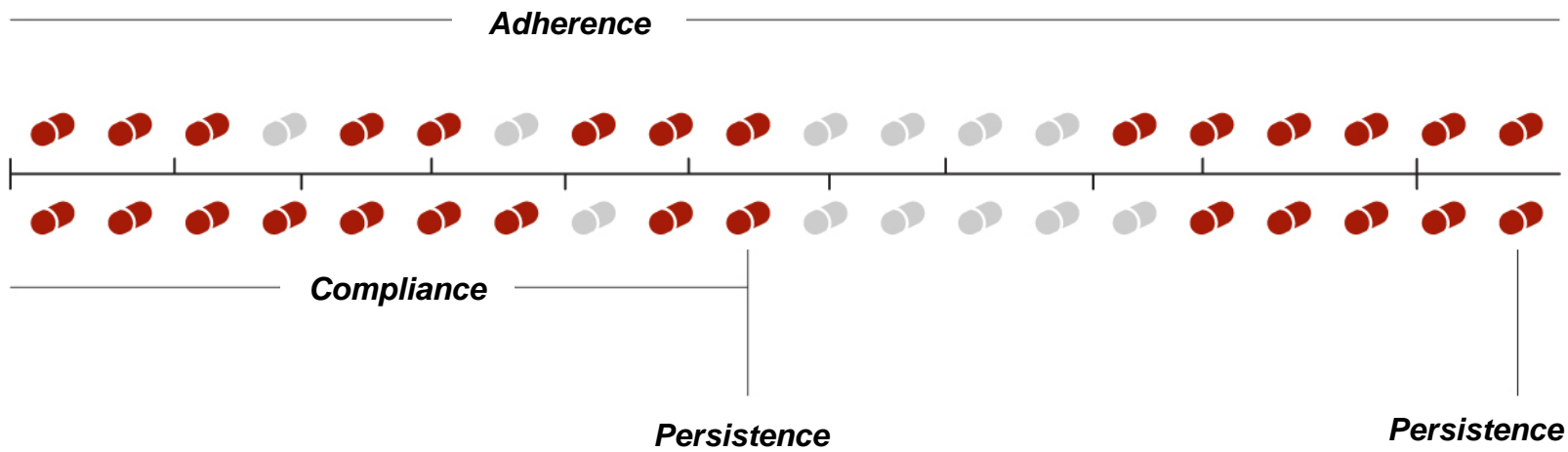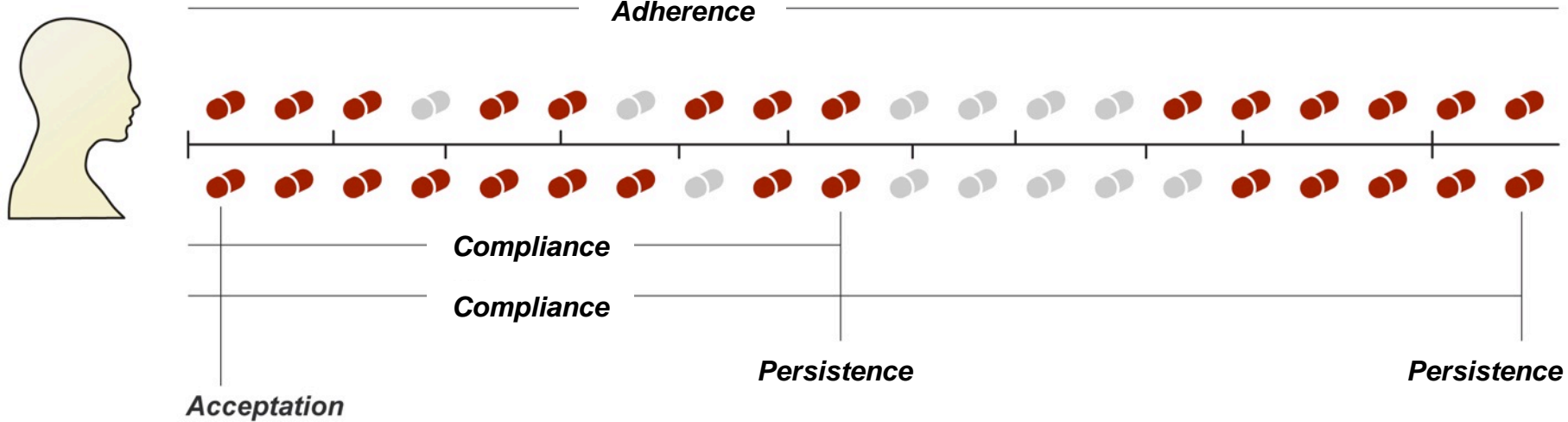
Magnitude of the problem

Medications for chronic diseases

- First prescription not filled: ~30%
- Filled only once: ~20%
- Individuals persisting after 6 months: ~65%
- % covered at least 80% of the time: ~75%

Magnitude of the problem

Suboptimal treatment outcomes

- DiMatteo et al., Med Care 2002

Higher healthcare costs and higher risk of hospitalization

- Sokol et al., Med Care 2005

Worldwide burden likely to increase

- WHO, 2003

Healthcare Costs

Hospitalization Risk
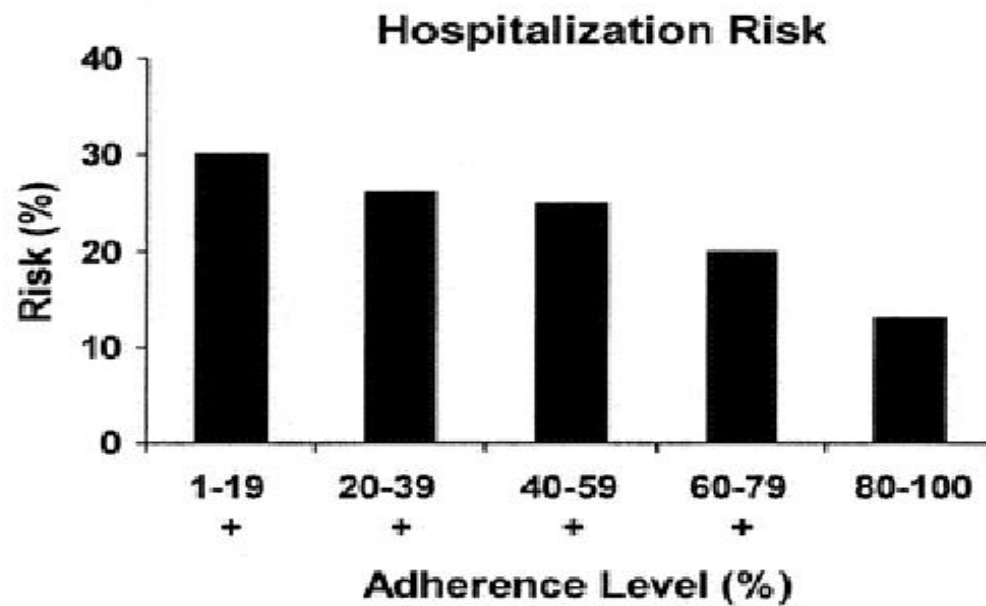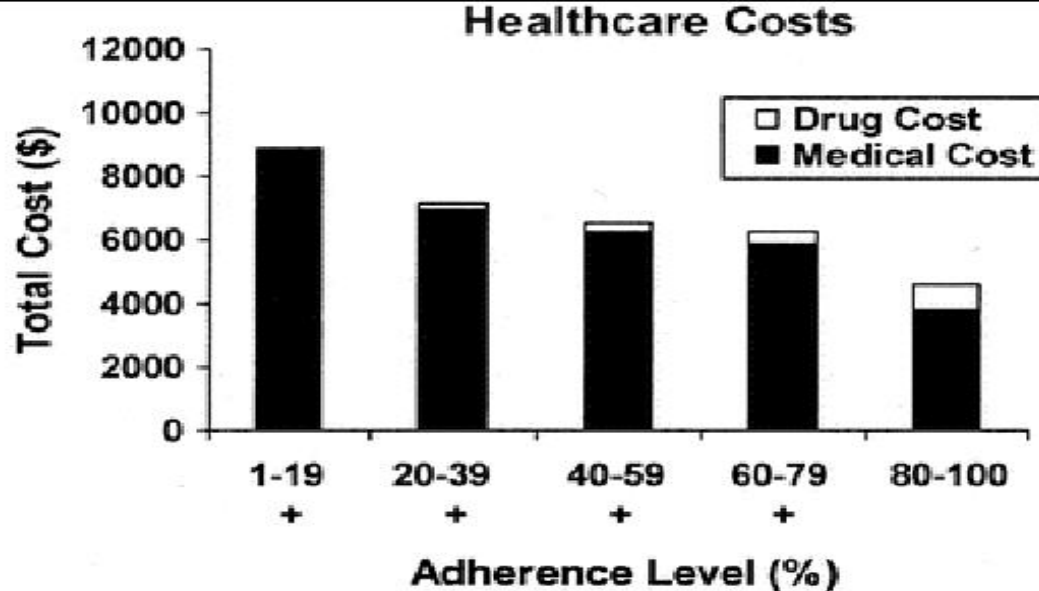
Estimated diabetes-related healthcare costs and hospitalization risk based on regression analyses. A plus sign (+) under a column denotes a value that is significantly higher than the outcome for the 80-100% adherence group ($P < 0.05$).

(Sokol *et al*. Med Care 2005)

Study – Adults with type 2 diabetes in Quebec

Design: Prospective cohort

Source: RAMQ databases (pharmaceutical services)

Population: New users of OAD (from 1/01/2000 to 31/12/2008)

Definitions

Persistence

- A claim for any AD in the period (45 or 90 days) preceding the one-year anniversary of the first claim

Compliance

- At least 80% of the days covered with any AD

Persistence

Figure 1: Persistence measurement

Compliance

MPR ≥ 80%
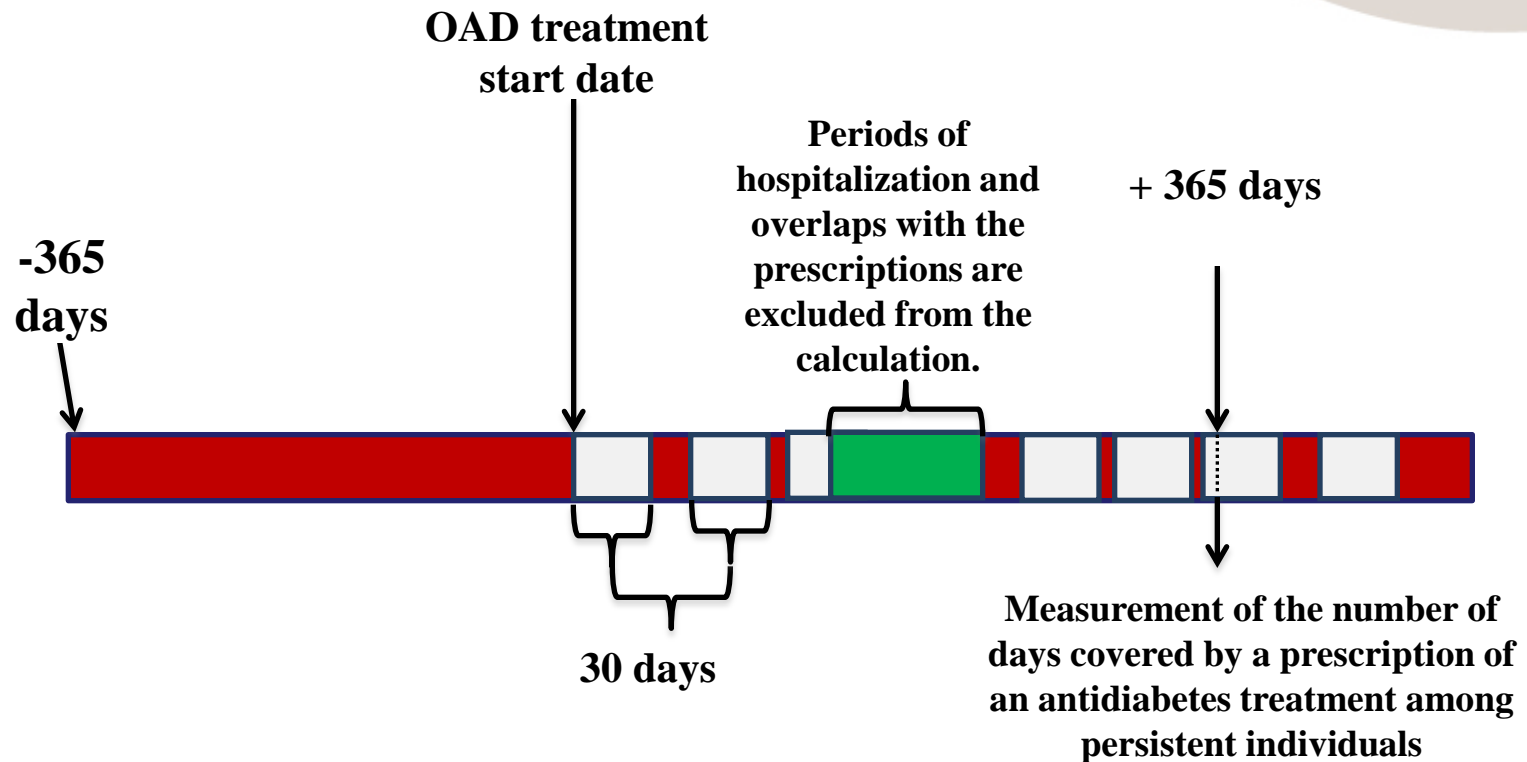
Figure 2: Compliance measurement

Results
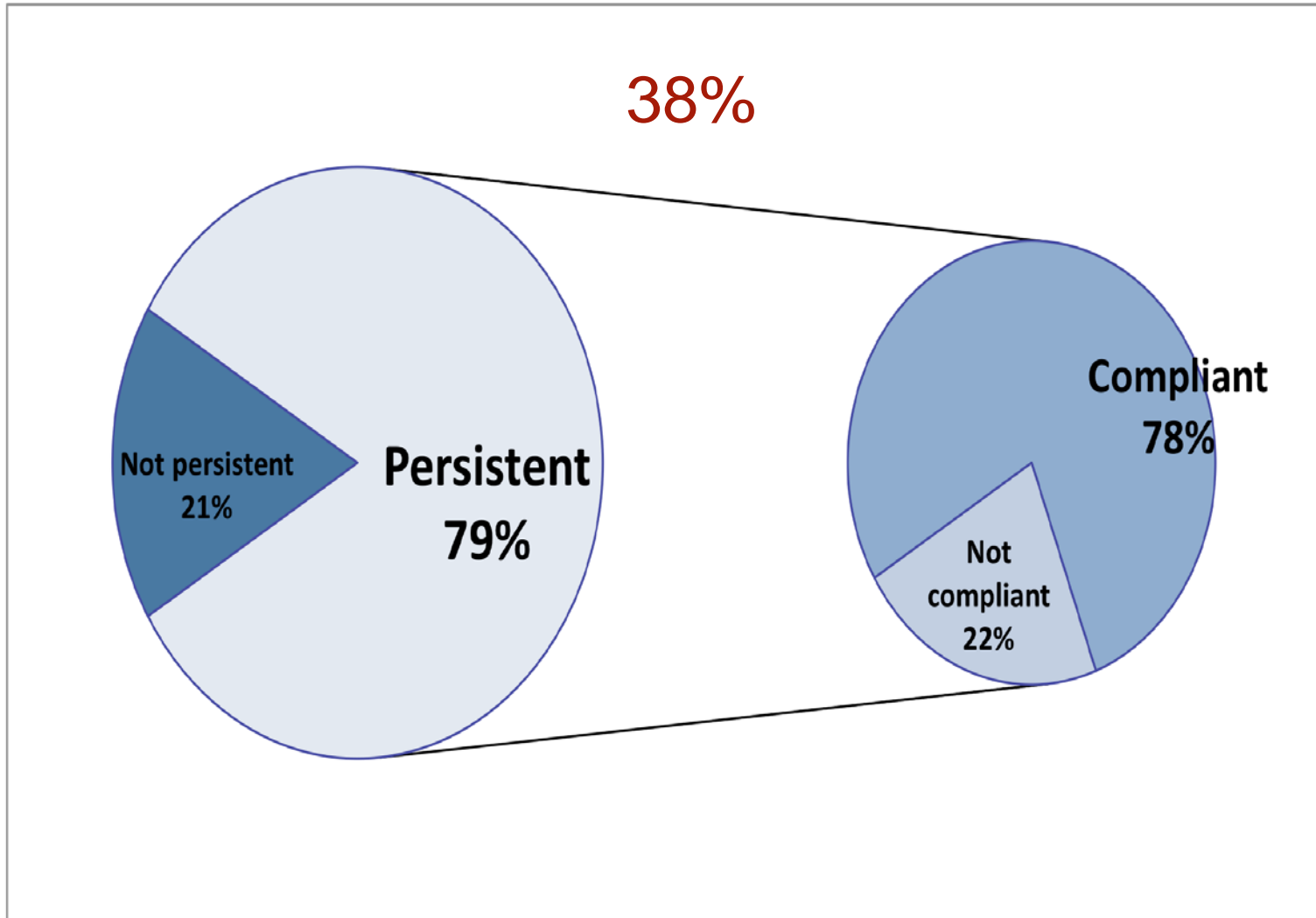
Is this an easy task for the patients?
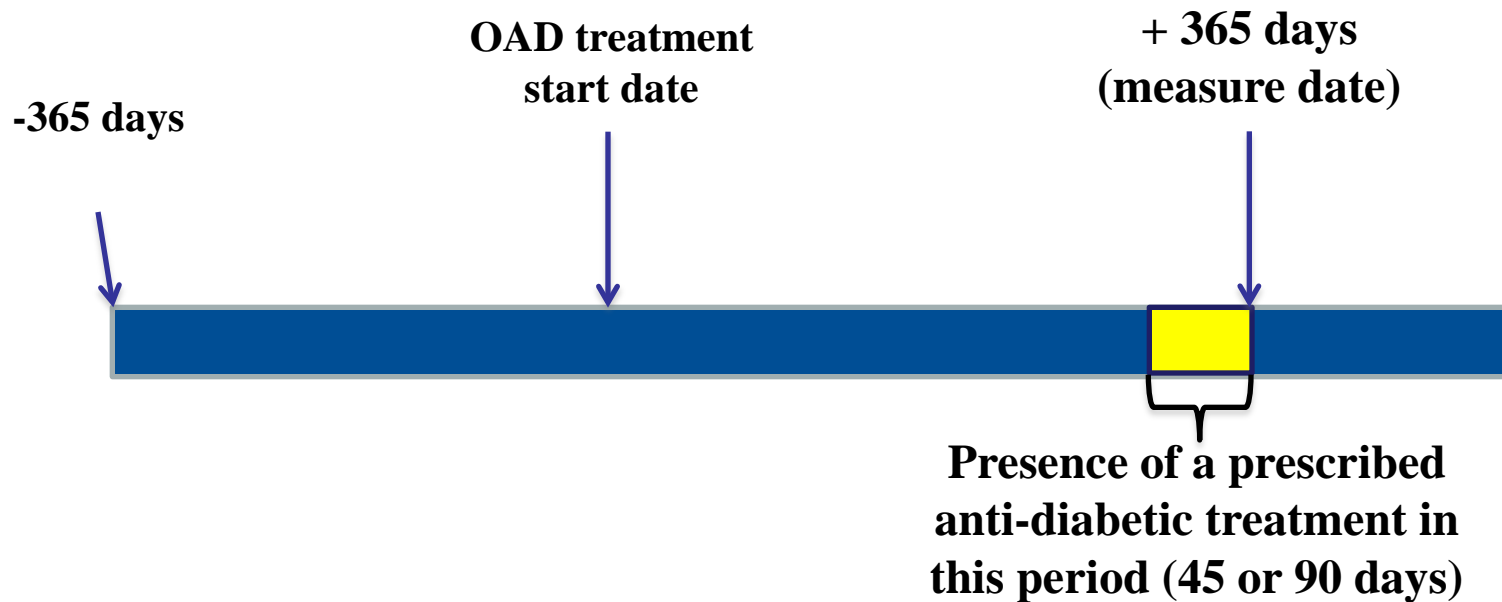
RESEARCH

Second-Year Pharmacy Students' Perceptions of Adhering to a Complex Simulated Medication Regimen

Timothy Ulbrich, PharmD, David Hamer, PharmD Candidate,[*] Kristin Lehotsky, PharmD Candidate[*]

Northeast Ohio Medical University, Rootstown

Table 1. Pharmacy Student Adherence to a Simulated Medication Regimen

Name/Strength of Simulated Medication	Directions	Use
Ipotrine, 25 mg	Take 1 tablet by mouth at bedtime	Hypertension
Synstap, 50 mg	Take 1 capsule by mouth three times daily	Osteoarthritis
Lopolix, 100 mg	Take 1 tablet by mouth in the morning on an empty stomach	Hypothyroidism
Maxtrip, 65 mg	Take 1 tablet by mouth once daily with food	Major Depressive Disorder
Triplor, 80 mg	Take 1 capsule by mouth twice daily	Dyslipidemia
Norvox XL, 100 mg	Take 1 tablet by mouth once daily	Community Acquired Pneumonia

Doses missed:

~16%

20%

11%

Why is it this way?

WHO's five dimensions of adherence
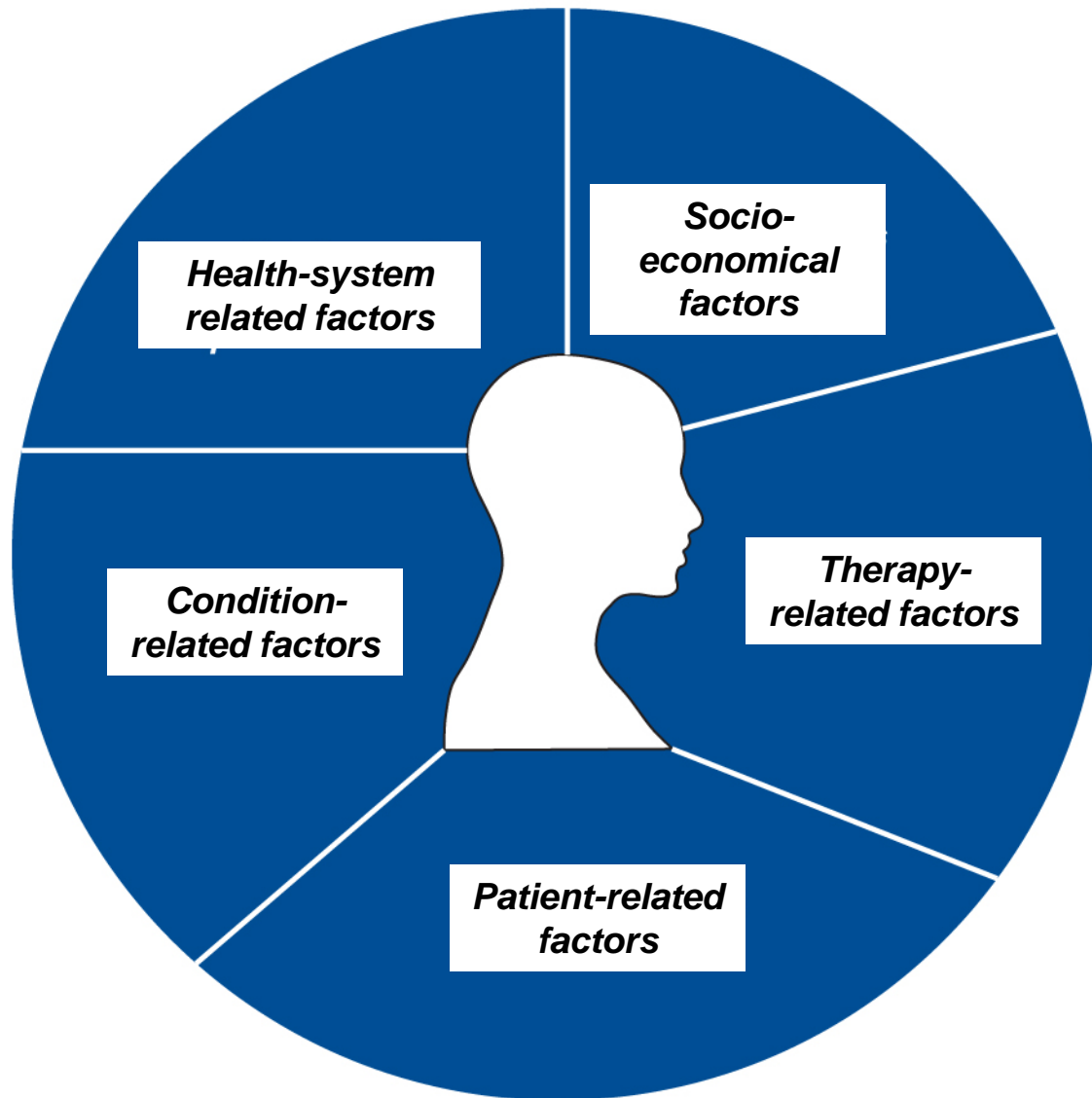
Characteristics associated with persistance and compliance with OAD treatment

Characteristics	Persistence (n=119,832)	Compliance (n= 93,418)
Age		
18-54	Reference	Reference
55-63	+	+
64-69	+	+
70-75	+	+
≥ 76	+	+
Gender	NR	NR
Region		
Urbain	Reference	Reference
Rural	+	+
Unavailable	-	=
Socioeconomic status		
High	Reference	Reference
Medium	+	+
Low	+	+

Characteristics	Persistence (n=119,832)	Compliance (n= 93,418)
Specialty of initial prescriber		
Endocrinologist or internist	Reference	Reference
GP	+	+
Other or unknown	-	=
Initial OAD		
Metformin	Reference	Reference
Secretagogue	-	-
Other	+	+
Hospitalization		
No	Reference	Reference
Yes	NR	+
Number of physician visits		
< 7	Reference	Reference
8-18	-	-
≥ 19	-	-
Number of distinct drugs		
< 4	Reference	Reference
5-8	+	+
≥ 9	+	+

Psychosocial determinants

- Beliefs
- Knowledge
- Motivation (I have the intention to take it as prescribed)
- Attitude (I am favorable, I see the advantages)
- Social norm (my family/friends approve or not)
- Perception of control (I can do it, I recognize the barriers)

Theoretical model

- Theory of planned behavior
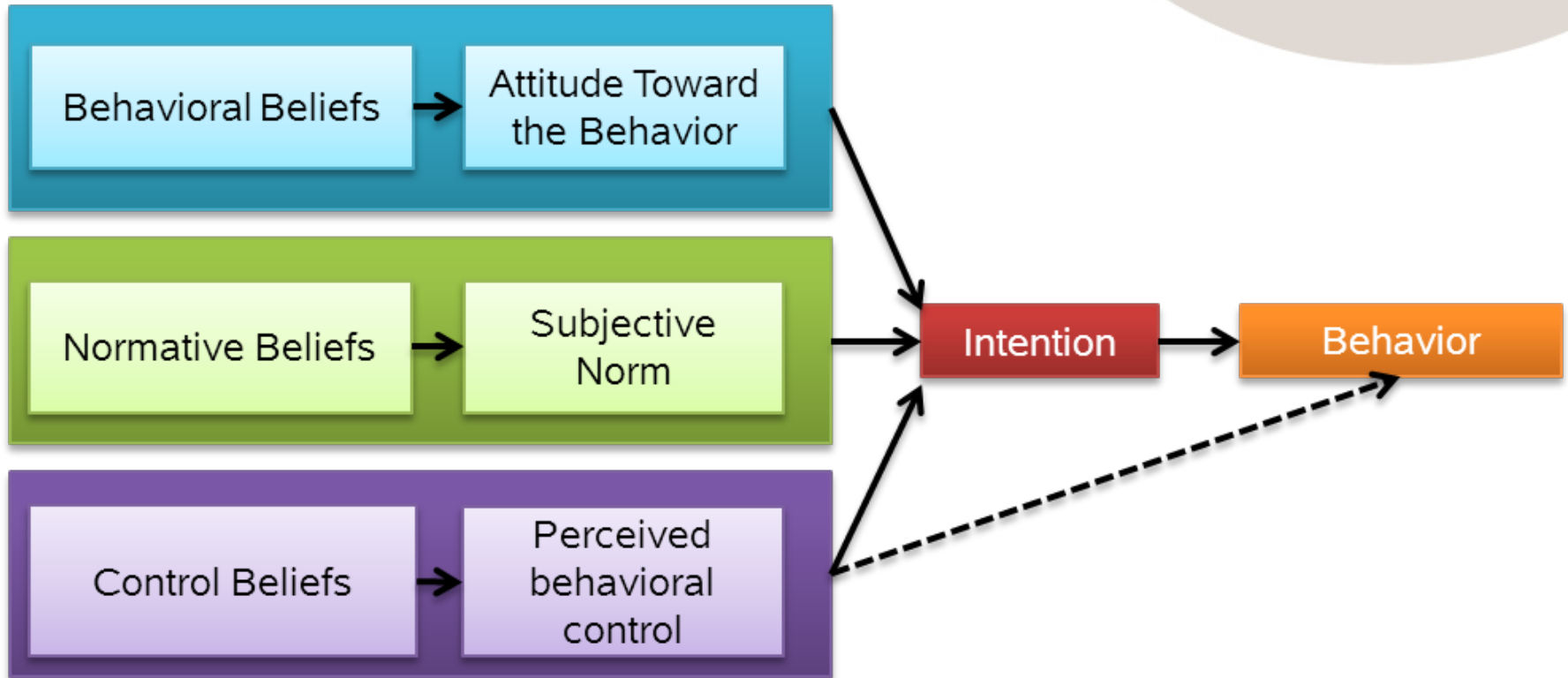
Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50, 179-211.

Study – Identification of salient beliefs

- **Method:**
  - o 6 focus-groups of 6 to 8 participants (n = 45)
  - oSemi-structured interview guide with the following questions asked: advantages/disadvantages, people who agree/disagree, facilitating factors/barriers to OAD treatment

  - **Analysis:**
  - o Content analysis by 3 members of the research team
  - o Beliefs most often mentioned were selected

Results – Salient beliefs

Beliefs	Frequency (%)	Cumulative frequency (%)
Advantages/Disadvantages		
Avoid long-term complications	14.7	14.7
Control glycemia	13.8	28.5
It gives me gastrointestinal problems (diarrhea, gas, etc.)	8.6	37.1
Feel good	7.8	44.9
Feel less tired	7.8	52.7
Not having to increase my medication	6.0	58.7
Avoid transfering to insulin	6.0	64.7
People who agree or disagree		
My spouse	28.6	28.6
My children	18.4	47.0
My family	14.3	61.3

Results – Salient beliefs

Beliefs	Frequency (%)	Cumulative frequency (%)
Facilitating factors		
To have them always on me	20.8	20.8
To keep an eye on them on the counter	12.9	33.7
To have a routine	11.9	45.6
To have somebody to remind me	10.0	55.6
To use a pill dispenser	8.9	64.5
Have a trick to help me remember	5.9	70.4
Barriers		
When we are away, on vacation, or in a restaurant	15.7	15.7
Not owning my disease and my medication	14.6	30.3
Not having confidence in the physician's prescription	11.2	41.5
When people come over	9.0	50.5

What can we do about this?

Interventions that we are developing

PHARE

COMMUNICATE

Intervention Mapping

Step 1: Needs assessment	• Survey with patients with type 2 diabetes • Focus groups with patients with type 2 diabetes • Interviews with key informants
Step 2: Matrices of change objectives	• Identification of changes targeted depending on step 1 results and literature review
Step 3: Identification of appropriate methods	• Choice of theoretical methods that can influence changes in identified determinants and practical applications to implement them
Step 4: Intervention production	• Creation of themes, sequence, and materials • Programming • Pretests and adjustments
Step 5: Adoption and implementation	• Intervention's launch • Adjustments

Thank You!

Line Guénette
Line.Guenette@pha.ulaval.ca

Faculté de pharmacie de l'Université Laval,
Unité de recherche en santé des populations, CHA de Québec