

# Are public campaigns effective to reduce antibiotic overconsumption ?

## Did we fail to provide what is needed by the general practitioner?

Paul M. Tulkens, MD, PhD

Cellular and Molecular Pharmacology  
Louvain Drug Research Institute  
*Université catholique de Louvain*  
Brussels, Belgium



Based on work performed with in collaboration with Jean-Marc Feron,<sup>1</sup> Michel Boutsen,<sup>2</sup> and Gilles Moreau<sup>3</sup>

<sup>1</sup> Centre académique de médecine générale, Université catholique de Louvain, Brussels, Belgium;

<sup>2</sup> Service d'études, Union nationale des Mutualités Socialistes, Brussels, Belgium

<sup>3</sup> Ecole de Santé publique, Université libre de Bruxelles, Brussels, Belgium

**3<sup>rd</sup> Global Microbiologists Annual Meeting**

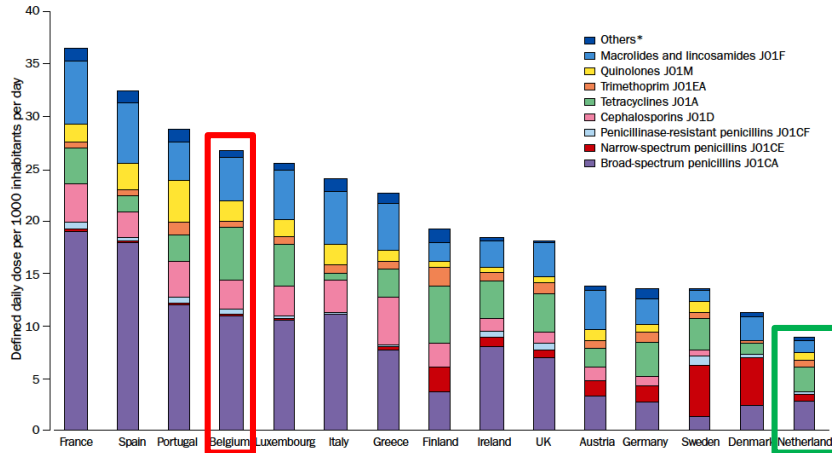
August 15-17, 2016 Portland, Oregon, USA

# Where has this material been published and/or presented ?

- Slides 3 through 16 (antibiotic consumption data 2000-2016): presented at
  - **ASM Microbe 2016** (American Society for Microbiology), Boston, Mass., 16-20 June 2016, as an oral presentation (Session Title: Antimicrobial Stewardship I - June 17, 2016)  
<http://www.facm.ucl.ac.be/posters/2016/ASM-Microbe-2016/Tulkens-antibiotic-consumption-and-public-campaigns-ASM-microbe-2016.pdf>
- Slides 17 through 34 (qualitative research): partly presented at the
  - **27ème Réunion Interdisciplinaire de Chimiothérapie Anti-Infectieuse (RICAI)**, Paris, France, 6-7 décembre 2007 (focus group studies), as an oral presentation (no. 235)  
<http://www.facm.ucl.ac.be/posters/2007/RICAI/Feron-et-al-RICAI-2007-oral-235.pdf>
  - **18th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID)** Barcelona, Spain, 19-22 April 2008 (Lot Quality Assurance Group study) as an oral presentation (O249)  
<http://www.facm.ucl.ac.be/posters/2008/ECCMID/Feron-et-al-ECCMID-2008-O-249.pdf>
  - **26th International Conference on Chemotherapy**, Toronto, Ont., 18-21 June 2009 (large survey), as a poster (P313)  
<http://www.facm.ucl.ac.be/posters/2009/ICC-2009/P-313-Feron-Motivations-ICC-2009.pdf>

# Why public campaigns for less use of antibiotics in the community in Belgium ?

1997



Outpatient antibiotic sales in 1997 in the European Union

\*Includes sulphonamides, penicillinase-resistant penicillins, amphenicols, aminoglycosides, and glycopeptides.

Cars *et al.* Lancet. 2001;357:1851-3 - PMID: [11410197](https://pubmed.ncbi.nlm.nih.gov/11410197/)

1997 - 1999

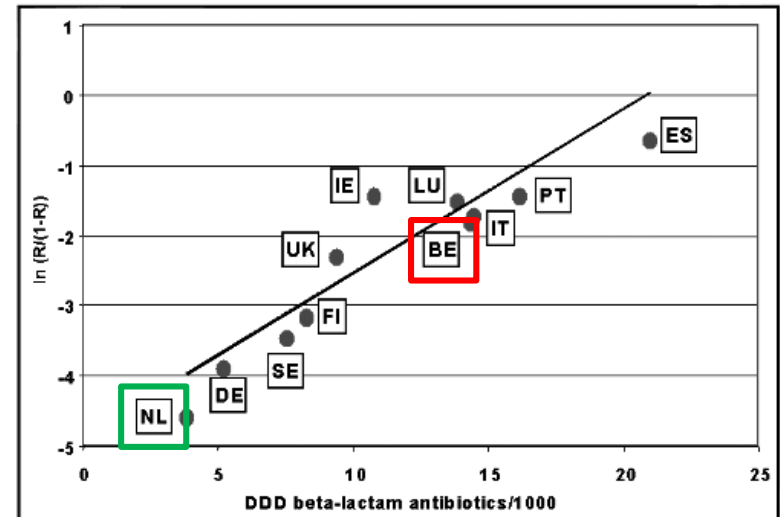


Figure 2. The log odds of resistance to penicillin among invasive isolates of *Streptococcus pneumoniae* (PNSP;  $\ln(R/(1-R))$ ) is regressed against outpatient sales of beta-lactam antibiotics in 11 European countries; antimicrobial resistance data are from 1998 to 1999 and antibiotic sales data are from 1997. DDD = defined daily dose; BE = Belgium; DE = Germany; FI = Finland; IE = Ireland; IT = Italy; LU = Luxembourg; NL = the Netherlands; PT = Portugal; ES = Spain; SE = Sweden; UK = United Kingdom.

The message was clear and understood:

- Belgium consumes too much antibiotics in the community, which creates resistance...
- If you reduce antibiotic pressure (DDDs) in the community, you will reduce resistance !



Bronzwaer *et al.* Emerg Infect Dis. 2002;8:278-82. PubMed PMID: [11927025](https://pubmed.ncbi.nlm.nih.gov/11927025/)

# So, we started public campaigns targeted to the community...

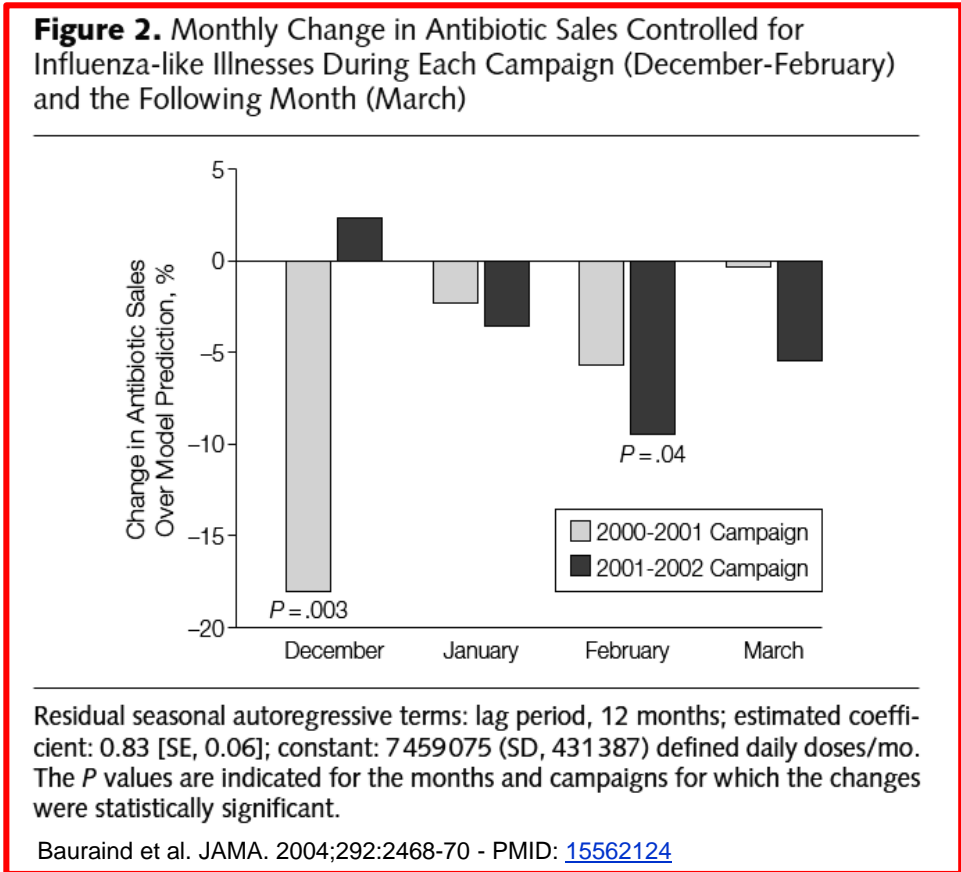
2000-2003



use less often and better

<http://www.red-antibiotica.org/> (Dutch)  
<http://www.antibiotiques.org/> (French)

And these first campaigns were modestly but significantly successful in reducing the number of DDD's per month in the winter periods of 2000-2001 and 2001-2002



# So, public campaigns targeted to the community were repeated each year with various themes...



[http://www.belgium.be/fr/actualites/2013/news\\_campagne\\_antibiotiques\\_2013](http://www.belgium.be/fr/actualites/2013/news_campagne_antibiotiques_2013)

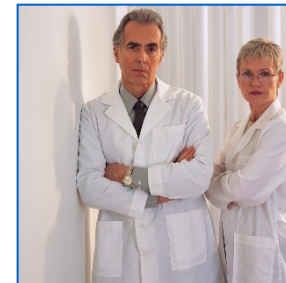


<http://www.gebruikantibioticacorrect.be/nl/lees-tante-biotica-online>

**LES ANTIBIOTIQUES**  
**PRENEZ-LES COMME IL FAUT ET UNIQUEMENT QUAND IL LE FAUT !**

Une mauvaise utilisation des antibiotiques rend les bactéries plus résistantes. Par conséquent, les maladies graves ne peuvent plus être traitées correctement. Veillez donc à ce que les antibiotiques agissent encore lorsque vous en aurez réellement besoin

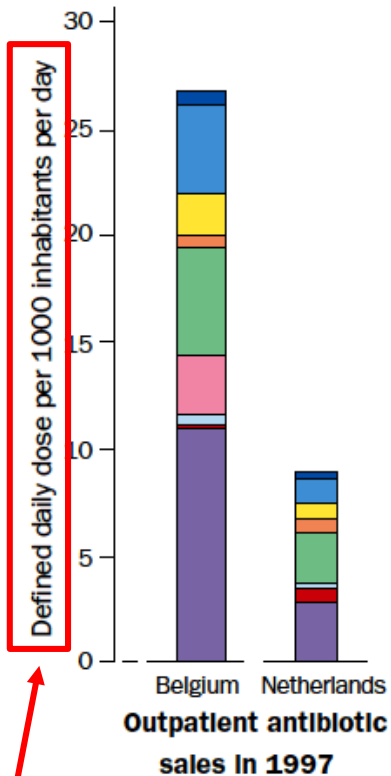
<http://www.usagecorrectantibiotiques.be/fr>



but what are the results ?

# What and how did we analyze the antibiotic pressure in the community ?

## What is a Defined Daily Dose and why did we use it ?



this is what triggered the campaigns

WHO Collaborating Centre for Drug Statistics Methodology

News	<h3 style="margin: 0;">Definition and general considerations</h3> <p><b>Definition and introduction</b> The basic <b>definition</b> of the defined daily dose (DDD) is:</p> <div style="border: 2px solid red; padding: 5px; margin-top: 10px;"> <p><i>The DDD is the assumed average maintenance dose per day for a drug used for its main indication in adults.</i></p> </div>
ATC/DDD Index	
ATC/DDD methodology	
ATC	
DDD	

[http://www.whocc.no/ddd/definition\\_and\\_general\\_considera/](http://www.whocc.no/ddd/definition_and_general_considera/)

"Introduction to Drug Utilization Research"



The use of DDD / 1,000 inhabitants / day allows for direct comparisons between countries, regions and health facilities without confounding factors such as

- differences in size of packages (prescription drugs are mostly sold as packages, NOT as units in Europe)
- differences in prices (markedly influenced by the introduction of generics, taking place to an increased extent since 2005 in Europe)

[http://www.whocc.no/filearchive/publications/drug\\_utilization\\_research.pdf](http://www.whocc.no/filearchive/publications/drug_utilization_research.pdf)

# Public data from the National Institute for Health and Disability Insurance (NIHDI [INAMI / RIZIV]\* )

Tableaux de bord pharmaceutiques - INAMI - Mozilla Firefox

File Edit View History Bookmarks Tools Help


Tableaux de bord pharmaceu... x

Tableaux de bord pharmaceutiques - INAMI

www.inami.fgov.be/fr/statisti cheap parking schipho

nl fr

Autres informations et services officiels: [www.belgium.be](http://www.belgium.be)

 Institut national d'assurance  
**INAMI** maladie-invalidité

## Tableaux de bord pharmaceutiques

Chaque année, nous illustrons le **profil de prescription des généralistes, spécialistes et des dentistes** dans les « tableaux de bord pharmaceutiques » suivants :

- volume (mesuré en DDD ou defined daily dose - dose définie journalière)**
- nombre de patients des principaux groupes de médicaments.

Nous utilisons pour cela notre [banque de données sur les médicaments vendus en pharmacies publiques \(Pharmanet\)](#).

Nous établissons les tableaux de bord autant que possible dans un contexte temporel. Nous pouvons ainsi observer et suivre certaines tendances dans le temps..

Pour chaque rapport (tableau de bord), il y a aussi un [guide de lecture](#).

prescription profiles of general practitioners, dentists, and specialists (in the community)

volume (measured as DDD's (defined daily doses))

**Data are available from 1997 through 2014**

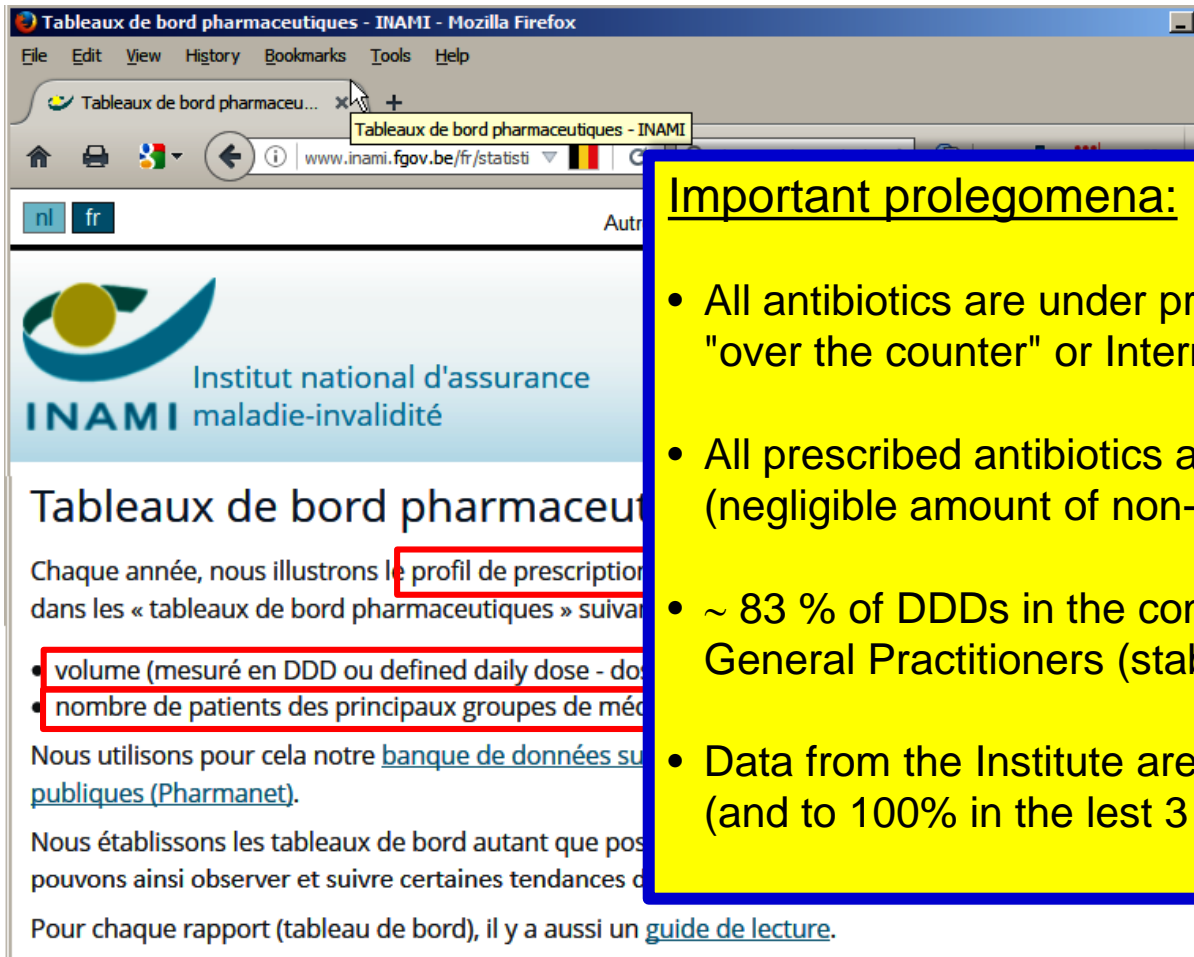
Tiny URL: <http://tinyurl.com/hwu74sf>:

Full URL: <http://www.inami.fgov.be/fr/statistiques/medicament/Pages/statistiques-medicaments-pharmanet-01.aspx#.V1wBn6JYyE0> (French)

Full URL: <http://www.inami.fgov.be/nl/statistieken/geneesmiddel/Paginas/statistieken-geneesmiddelen-farmanet-01.aspx#.V1wDhKJYyE0> (Dutch)

\* *Institut national d'assurance maladie-invalidité / Rijksinstituut voor ziekte- en invaliditeit verzekering*

# Public data from the National Institute for Sickness and Invalidity Insurance (INAMI / RIZIV\*)



The screenshot shows a Mozilla Firefox browser window displaying the INAMI website. The page title is "Tableaux de bord pharmaceutiques - INAMI". The browser address bar shows "www.inami.fgov.be/fr/statisti". The website header includes the INAMI logo and the text "Institut national d'assurance maladie-invalidité". The main content area is titled "Tableaux de bord pharmaceutiques" and contains the following text:

Chaque année, nous illustrons le profil de prescription dans les « tableaux de bord pharmaceutiques » suivants :

- volume (mesuré en DDD ou defined daily dose - dose définie)
- nombre de patients des principaux groupes de médicaments

Nous utilisons pour cela notre [banque de données statistiques publiques \(Pharmanet\)](#).

Nous établissons les tableaux de bord autant que possible afin que nous pouvons ainsi observer et suivre certaines tendances de prescription.

Pour chaque rapport (tableau de bord), il y a aussi un [guide de lecture](#).

## Important prolegomena:

- All antibiotics are under prescription in Belgium (negligible "over the counter" or Internet sales)
- All prescribed antibiotics are reimbursed in Belgium (negligible amount of non-reimbursed forms)
- ~ 83 % of DDDs in the community are prescribed by General Practitioners (stable over years)
- Data from the Institute are considered correct to > 96.9% (and to 100% in the last 3 years).

Tiny URL: <http://tinyurl.com/hwu74sf>:

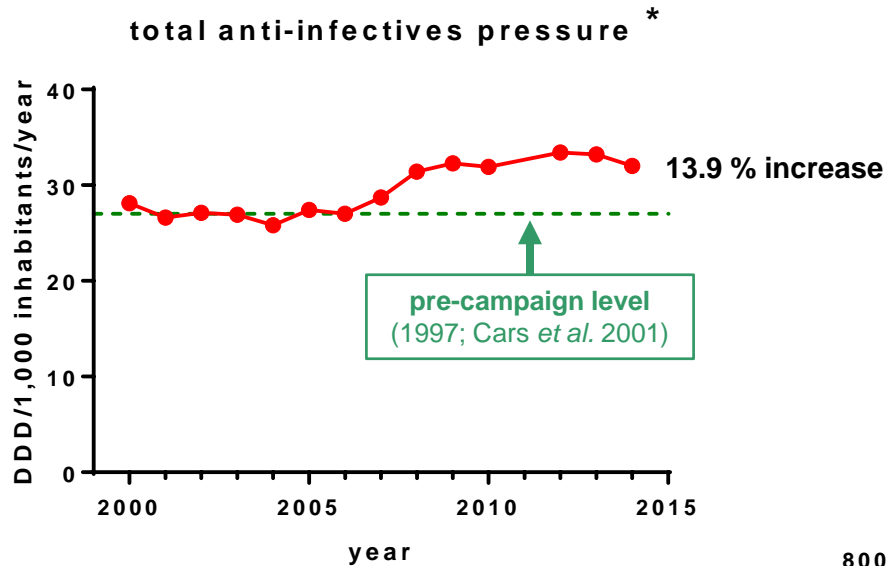
Full URL: <http://www.inami.fgov.be/fr/statistiques/medicament/Pages/statistiques-medicaments-pharmanet-01.aspx#.V1wBn6JYyE0> (French)

Full URL: <http://www.inami.fgov.be/nl/statistieken/geneesmiddel/Paginas/statistieken-geneesmiddelen-farmanet-01.aspx#.V1wDhKJYyE0> (Dutch)

\* Institut national d'assurance maladie-invalidité / Rijksinstituut voor ziekte- en invaliditeit verzekering

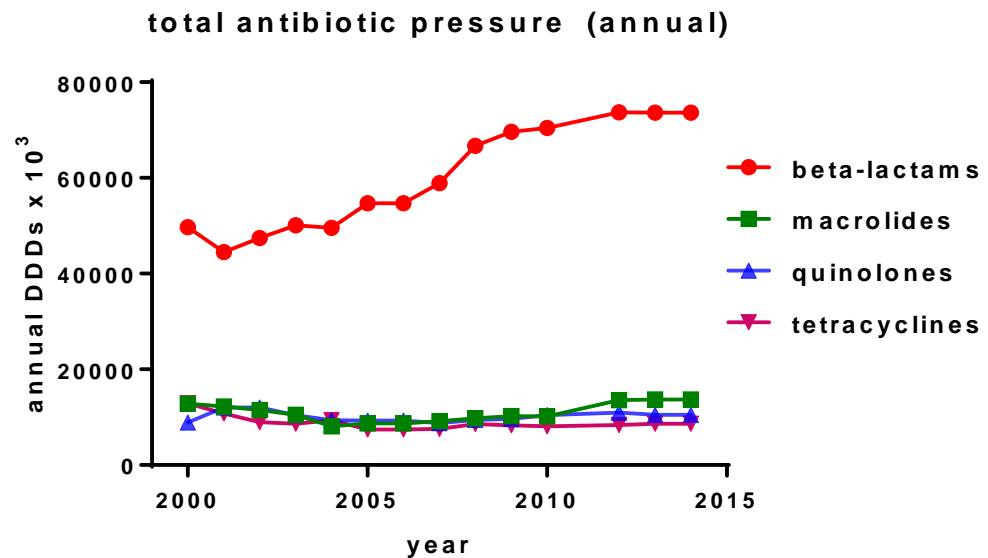


# What did we find ?



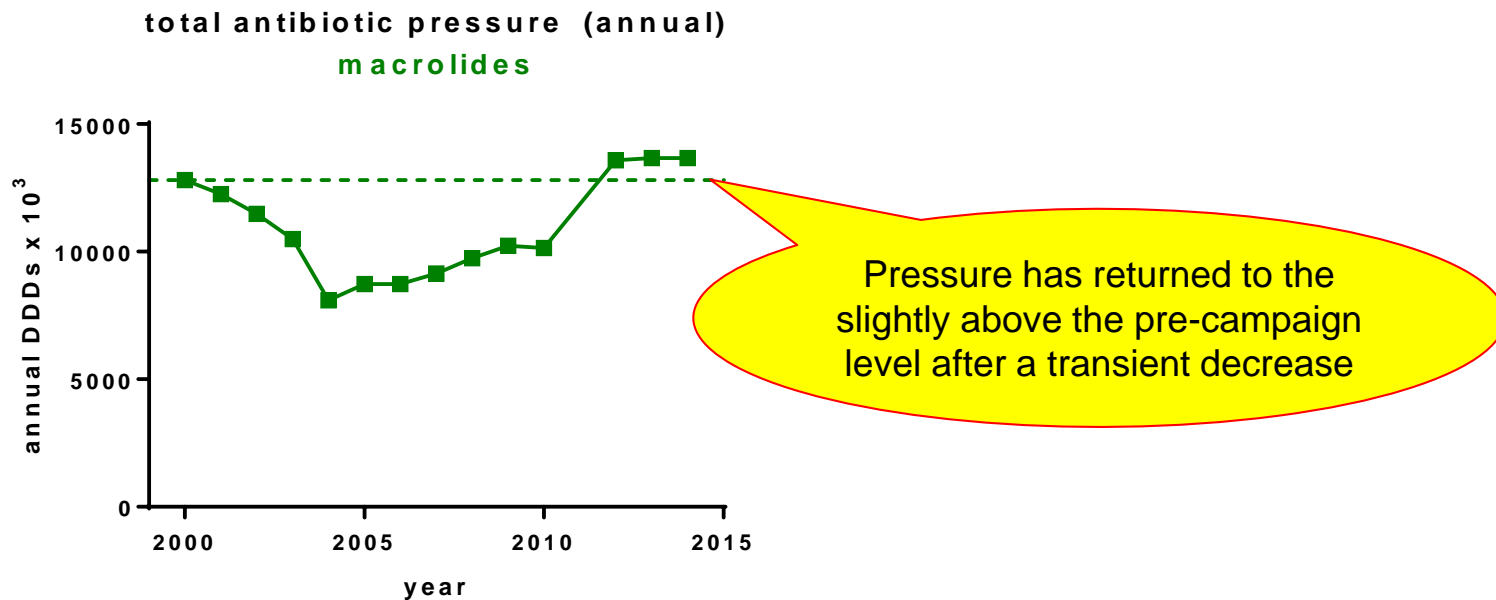
\* defined as DDD's of ATC class J drugs (anti-infectives for systemic use) reimbursed in the community (~ 85% antibiotics)

## But which antibiotics ?



# Were targeted efforts rewarded ?

1. *S. pneumoniae* full resistance to macrolides in clinically confirmed CAP and clinically-confirmed confirmed COPD is ~ 25 % in Belgium \* and is, therefore, no longer recommended as first line ...

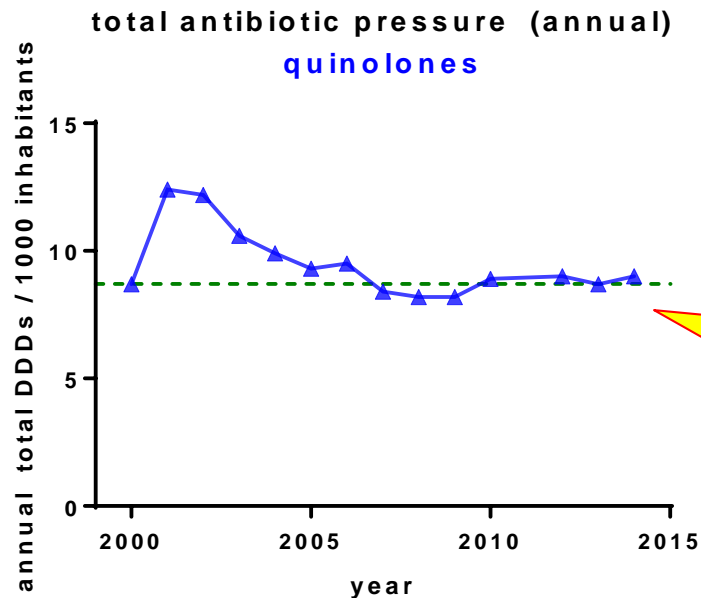


\* Lismond *et al.* Intern J Antimicrob Agents (2012) 39:208–216 - PMID: [22245497](#)

Vandeveldel *et al.* Intern J Antimicrob Agents (2014) 44:209–217 - PMID: [25123808](#)

# Were targeted efforts rewarded ?

2. Many actions were taken to reduce what was considered as an exaggerated prescription of quinolones in Belgium \* (31% of total DDDs in 2000)



after a short burst (due to the introduction of the so-called "respiratory quinolones", pressure has returned to baseline

\* see, for example,

- the limited recommendations of fluoroquinolones in the antibiotic guidelines for GPs (available at <http://www.health.belgium.be/fr/antibiotiques-guide-belge-des-traitements-anti-infectieux-en-pratique-ambulatoire> <http://www.health.belgium.be/nl/antibioticabelgische-gids-voor-anti-infectieuze-behandeling> )
- information letters and GP's profiling made by the National Institute for Health and Disability Insurance (NIHDI [INAMI / RIZIV]) available at <http://www.inami.fgov.be/fr/recherche/pages/default.aspx?k=antibiotiques#.V10T4KJYyE1> <http://www.inami.fgov.be/nl/zoeken/paginas/default.aspx?k=antibiotica#.V10Ux6JYyE0>

# A problem of metrics ?

- DDDs are not perfect and may not represent actual prescribed doses ...  
→ but they are the metric used to trigger actions about resistance...

this is in  
DDD's

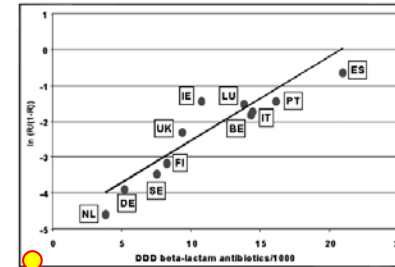


Figure 2. The  $\ln(1+R)$  (proportion of resistance to penicillin among invasive isolates of *Streptococcus pneumoniae* (DNSP - ln(R+1))) is regressed against outpatient sales of beta-lactam antibiotics in 11 European countries; antimicrobial resistance data are from 1998 to 1999 and antibiotic sales data are from 1997. DDD = defined daily dose; BE = Belgium; DE = Germany; FI = Finland; IE = Ireland; IT = Italy; LU = Luxembourg; NL = the Netherlands; PT = Portugal; ES = Spain; SE = Sweden; UK = United Kingdom.

## Other metrics are available... but may have other problems

- **packages** (in Europe): assumed to better represent prescriptions ... and showing a decrease of 17% between 2002 and 2009 vs. an increase in DDDs of 12 %  
(see Coenen *et al.* J Antimicrob Chemother. 2014;69:529-34 - PMID: [24084641](https://pubmed.ncbi.nlm.nih.gov/24084641/))  
but package sizes change over time ... as mainly decided by Industry ...  
(e.g., major changes for amoxicillin and amoxi-clav in Belgium, largely but not only for commercial positioning...)  
and may not express the overall antibiotic pressure and risk of resistance... and a recent analysis of data for French-speaking Belgium indicates that the no. of prescription has slightly increased between 2004 and 2013 (unpublished data)
- **prices**: useful for business and some politicians ... but highly variable between countries ... and markedly influenced by the introduction of generics...  
(e.g., the price of levofloxacin was halved (incl. for the original) upon introduction of generics in Belgium)

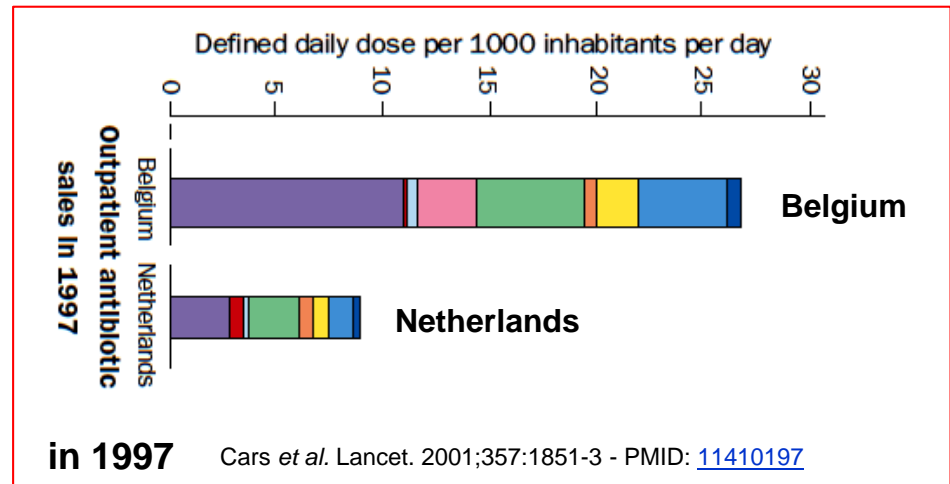
# At the end, the real questions...

- Why do we do public campaigns ?

→ To reduce unnecessary usage of antibiotics ?

If such, would a decreased number of packages explain the large differences in DDDs between Belgium and the Netherlands ?

Or, is the antibiotic pressure really different ?



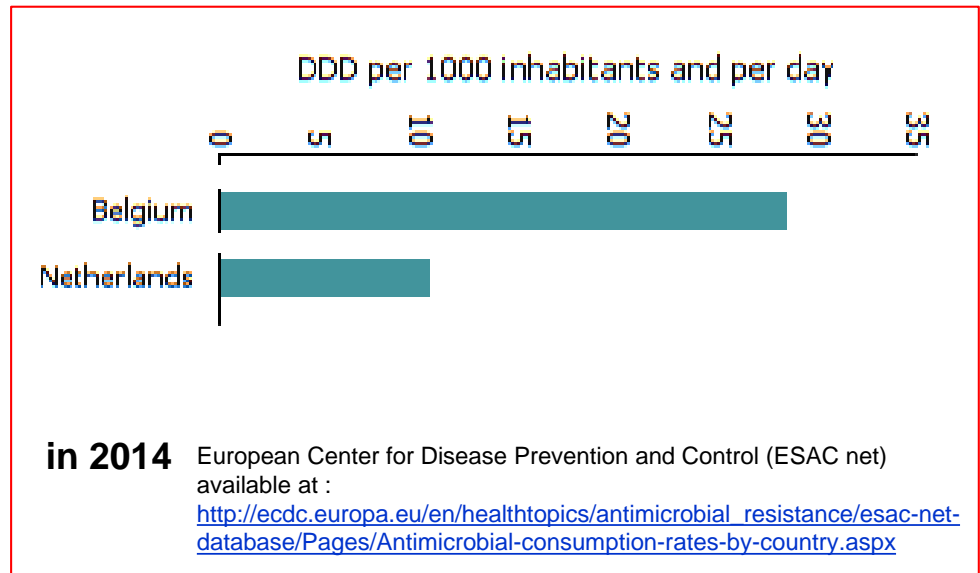
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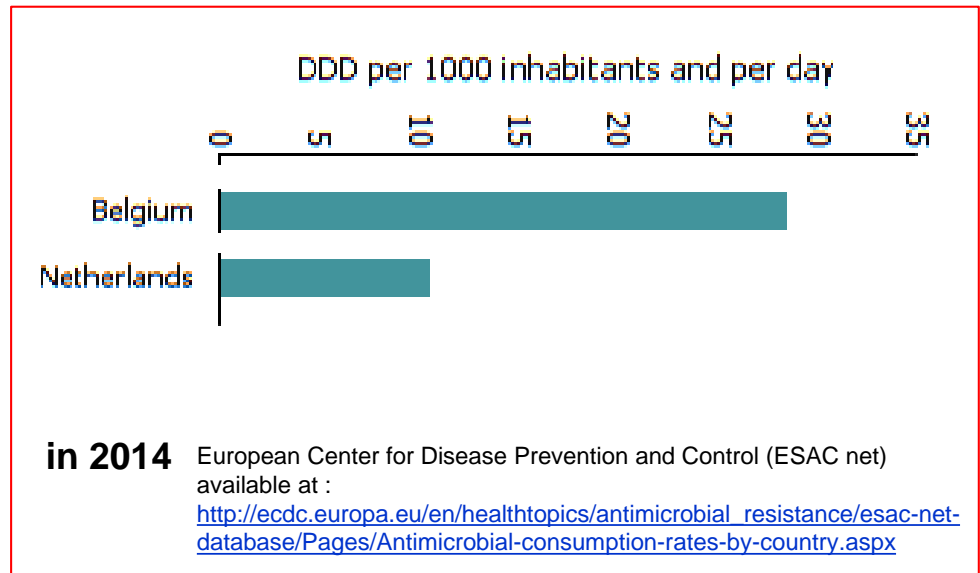
# At the end, the real questions...

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Or, is the antibiotic pressure really different ?



→ To reduce the rate of emergence of resistance ?

→ To save money ?

# And why could campaigns be ineffective ? \*

- Did we address the REAL questions for the doctor ?
- and for the patient...

The next series of slides will present a summary of studies undertaken between 2006 and 2010, i.e. in the middle of the period examined for antibiotic consumption and when the campaigns were in full swing....



# Three studies with General Practitioners

- Qualitative research: Focus groups with active general practitioners (4 groups of 10 practitioners)
- Qualitative research: Lot Quality Assurance Group: in depth analysis of the actual act of antibiotic prescription with 30 General Practitioners
- Large scale survey with 400 practitioners

# Qualitative research

- Qualitative research approach aims at discovering and assessing **motives** (not facts)
- It allows building an in-depth understanding of **human behavior and of its underlying motives**
- It is **hypothesis-generating**.

I would study not what you  
(or me) presented here  
but why you (I) did it ...

# Qualitative studies and focus groups

- Qualitative research methods research has been well defined and applied in a number of health care situations <sup>1</sup>
- It often uses the method of the semi-structured interviews with groups (focus groups <sup>2</sup>) analyzed using the grounded theory approach.
  - several stakeholders are asked about their attitude towards a service, a concept, or other point of common interest, with emphasis on participants' interactions.
  - The grounded theory is a research method in which categories of concepts are formed from an objective analysis of the data and used as the basis for the creation of a theory.<sup>3,4</sup>

1. Pope & Mays: *BMJ* 1995; 311, 42-5; Huston & Rowan: *Can Fam Physician* 1998; 44, 2453-8; Malterud: *Lancet* 2001; 358, 397-400; Malterud: *Lancet* 2001; 358, 483-8; Giacomini & Cook: *JAMA* 2000; 284, 357-62.

2. Kitzinger: *BMJ* 1995; 311, 299-302.

3. Glaser & Strauss A. (1967): *The discovery of grounded theory: strategies for qualitative research*, Aldine, New York; Glaser (1978): *Advances in the methodology of grounded theory: theoretical sensitivity*, Sociology Press, Mill Valley.

4. Spinewine et al. *BMJ* 2005; **331**, 935.

# Focus groups interview guide

1. You are consulted by an adult patient who is complaining about symptoms of common cold (cough, tiredness, recently occurred). What comes to your mind? What is your approach?
2. Which clinical clues do you seek in your diagnosis approach?
3. Once you have made a good probability diagnosis, in which case do you decide to prescribe an antibiotic? In which case do you always/never prescribe an antibiotic?
4. What does the patient seek when consulting you for an acute respiratory tract infection? If she/he has a special demand, how do you manage it?
5. What are your information sources regarding antibiotic use in respiratory tract infection? What do you think about them? Can you give some examples?
6. Are there some structural aspects in our health care system that may influence you in your decision to prescribe? Why?
7. Do you want to add anything?

# Analysis of the focus groups:

Conceptual groups and emergent themes motivating an the antibiotic prescription for benign respiratory tract infection

<b>Conceptual group</b>	<b>Emergent theme</b>
<b>Clinical approach</b>	<ul style="list-style-type: none"><li>- <b>perceived severity of the disease</b></li><li>- <b>fragility of the patient</b></li><li>- <b>uncertainty of the etiological diagnosis</b></li></ul>
<b>Socio-cultural and structural elements</b>	<ul style="list-style-type: none"><li>- <b>patient's demand</b></li><li>- <b>provider-client relationship</b></li><li>- <b>reimbursement scheme</b></li></ul>
<b>Training and information</b>	<ul style="list-style-type: none"><li>- <b>guidelines</b></li><li>- <b>experts' opinion and guidance</b></li></ul>

# Analysis of the focus groups:

Conceptual groups and emergent themes motivating an the antibiotic prescription for benign respiratory tract infection

Conceptual group	Emergent theme
Clinical approach	- perceived severity of the disease <b>My patients are really sick !</b>
	- fragility of the patient <b>This is a child, ... and elderly</b>
	- uncertainty of the etiological diagnosis <b>How do I know it is viral ?</b>
Socio-cultural and structural elements	- patient's demand
	- provider-client relationship
	- reimbursement scheme
Training and information	- guidelines
	- experts' opinion and guidance

# Analysis of the focus groups:

Conceptual groups and emergent themes motivating an the antibiotic prescription for benign respiratory tract infection

Conceptual group	Emergent theme
Clinical approach	<ul style="list-style-type: none"><li>- perceived severity of the disease</li><li>- fragility of the patient</li><li>- uncertainty of the etiological diagnosis</li></ul>
Socio-cultural and structural elements	<ul style="list-style-type: none"><li>- patient's demand <b>My patients ask for !</b></li><li>- provider-client relations <b>I must "deliver" something</b></li><li>- reimbursement scheme <b>It is so cheap (for the patient)...</b></li></ul>
Training and information	<ul style="list-style-type: none"><li>- guidelines</li><li>- experts' opinion and guidance</li></ul>

# Analysis of the focus groups:

Conceptual groups and emergent themes motivating an the antibiotic prescription for benign respiratory tract infection

Conceptual group	Emergent theme
Clinical approach	<ul style="list-style-type: none"><li>- perceived severity of the disease</li><li>- fragility of the patient</li><li>- uncertainty of the etiological diagnosis</li></ul>
Socio-cultural and structural elements	<ul style="list-style-type: none"><li>- patient's demand</li><li>- provider-client relationship</li><li>- reimbursement scheme</li></ul>
Training and information	<ul style="list-style-type: none"><li>- guidelines <b>Most guidelines are anapplicable !</b></li><li>- experts' opinion and guidance <b>guidance is for money only !</b></li></ul>



# Qualitative research: Lot Quality Assurance Group

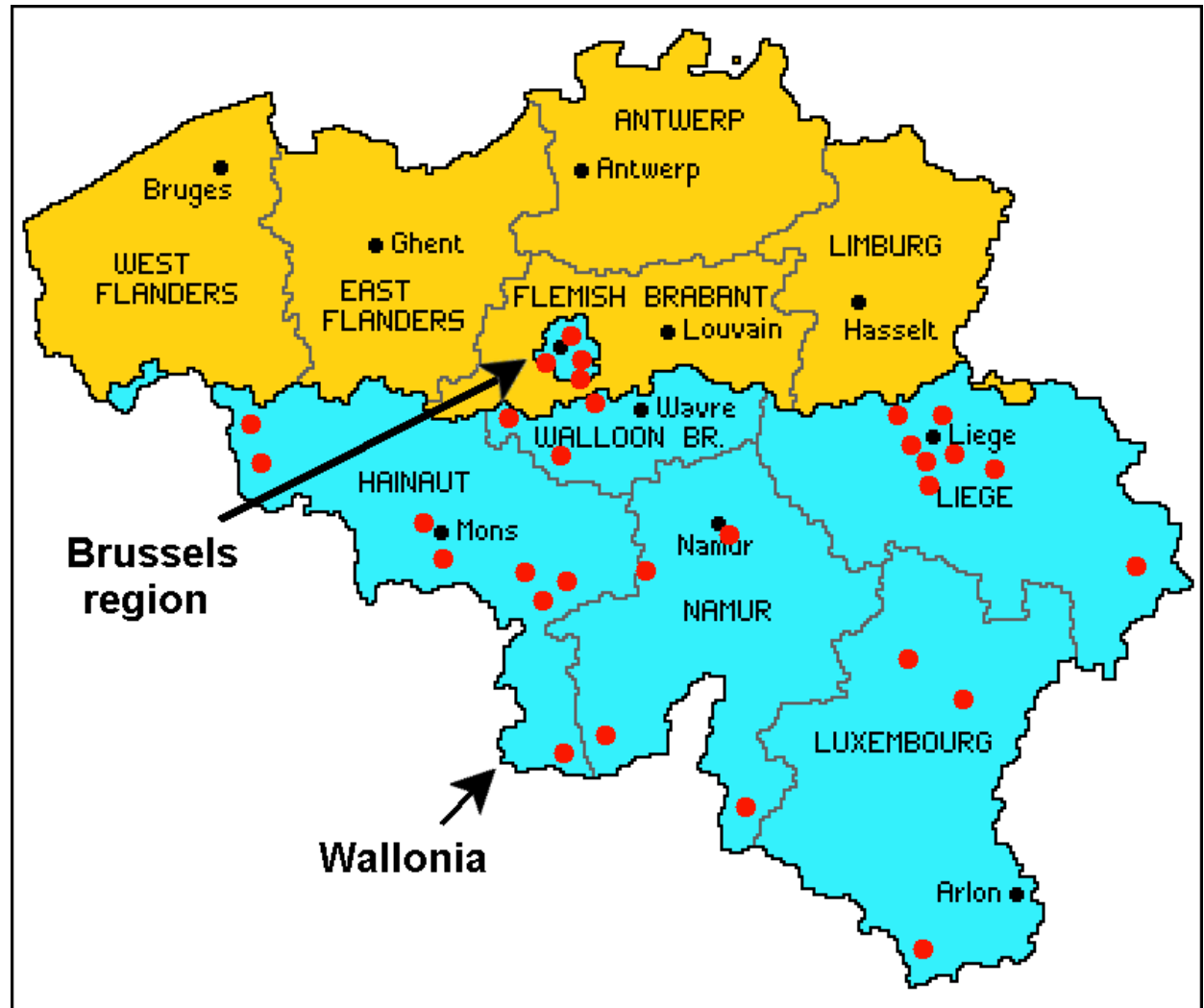
- In-depth analysis of a process performed by a **limited number of individuals** but for which the extent of **knowledge gained by examining all critical aspects of the process** compensates for the small number of cases examined.
- Originally developed in the manufacturing sector to control the quality of finished products (to reduce the actual number of pieces examined: better examine in details a few than superficially many)
- Introduced in medicine to assess health care services, health behaviors, and disease burden against pre-defined standards.<sup>1</sup>

1. Lanata et al. *Lancet* 1988; **1**, 122-3; Lanata et al. *Int J Epidemiol* 1990; **19**, 1086-90; Monte et al. *Am J Manag Care* 2008; **14**, 190-6.

# Qualitative research:

## Lot Quality Assurance Group: who did we examine ?

30 general practitioners spread over the French-speaking part of Belgium as a function of the population density



# Qualitative research:

## Lot Quality Assurance Group: what did we examine ?

Type	Actual data collected
<b>Medical notes</b>	<ul style="list-style-type: none"><li>- hand-written / computer-based</li><li>- other (including none)</li></ul>
<b>Reasons for encounter</b> <b>Characteristics of the patient</b>	<ul style="list-style-type: none"><li>- global picture of the consultation.</li><li>- patient already seen (yes/no)</li><li>- sex, age</li><li>- medical history (known pathologies)</li><li>- smoking (yes/no)</li><li>- professionally active (yes/no)</li></ul>
<b>General clinical status of the patient</b>	<ul style="list-style-type: none"><li>- non-severe / severe / alarming</li></ul>
<b>Anamnesis</b>	<ul style="list-style-type: none"><li>- cough (dry / productive), wheezing, dyspnoea</li><li>- sore throat, headache, muscular pain, thoracic pain</li><li>- coloured sputum, rhinorhea, otorhea</li><li>- necessity of work or school leave</li><li>- other</li></ul>

# Qualitative research:

## Lot Quality Assurance Group: what did we examine ?

<b>Alteration of the general status</b>	<ul style="list-style-type: none"><li>- fever</li><li>- fatigue</li><li>- loss of appetite</li><li>- inability to perform normal work</li><li>- patient feeling ill</li><li>- other</li></ul>
<b>Clinical examination</b>	<ul style="list-style-type: none"><li>- pathological throat or amygdale</li><li>- nasal congestion</li><li>- abnormal tympanum</li><li>- abnormal auscultation</li><li>- adenopathies</li><li>- sinus tenderness</li><li>- other</li></ul>
<b>Patient's demand</b>	<ul style="list-style-type: none"><li>- important - moderate - not important</li></ul>

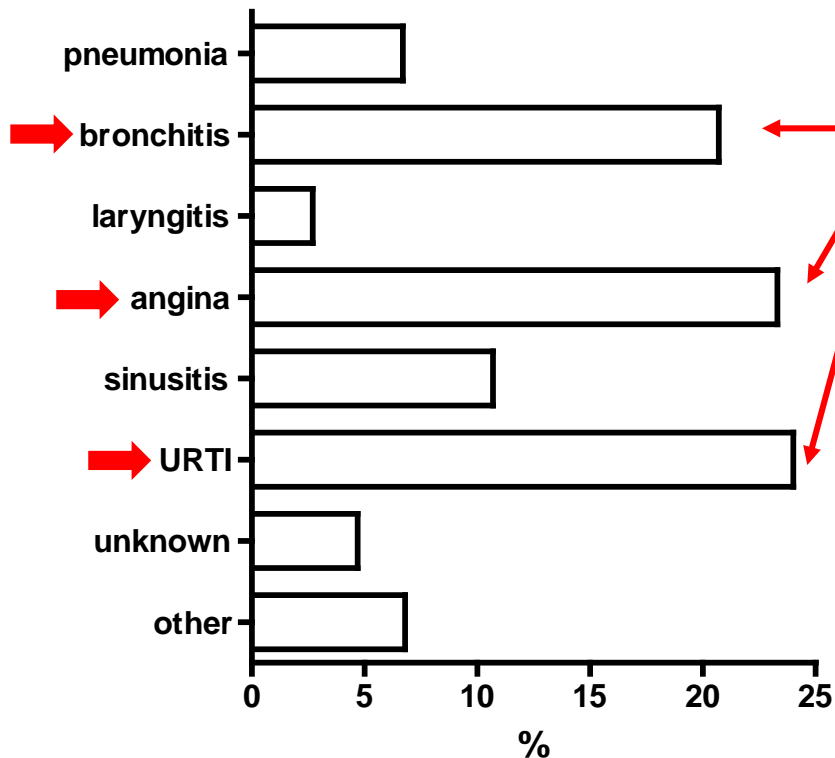
# Qualitative research:

## Lot Quality Assurance Group: what did we examine ?

<b>complementary examinations</b>	<ul style="list-style-type: none"><li>- biological investigations</li><li>- RX</li><li>- other</li></ul>
<b>certainty of the clinical diagnostic</b>	<ul style="list-style-type: none"><li>- ranked from 1 (doubtful) to 5 (certain)</li></ul>
<b>antibiotic(s) prescribed</b>	<ul style="list-style-type: none"><li>- trade name, dosage, schedule</li><li>- additional non-antibiotic treatments (yes/no)</li></ul>
<b>decisive criteria for antibiotic prescribing</b>	<ul style="list-style-type: none"><li>- entry left free for expression by GP</li></ul>
<b>compliance with official guidelines (according to the prescriber)</b>	<ul style="list-style-type: none"><li>- yes / no / not known</li><li>- if no or not know, why ?</li></ul>

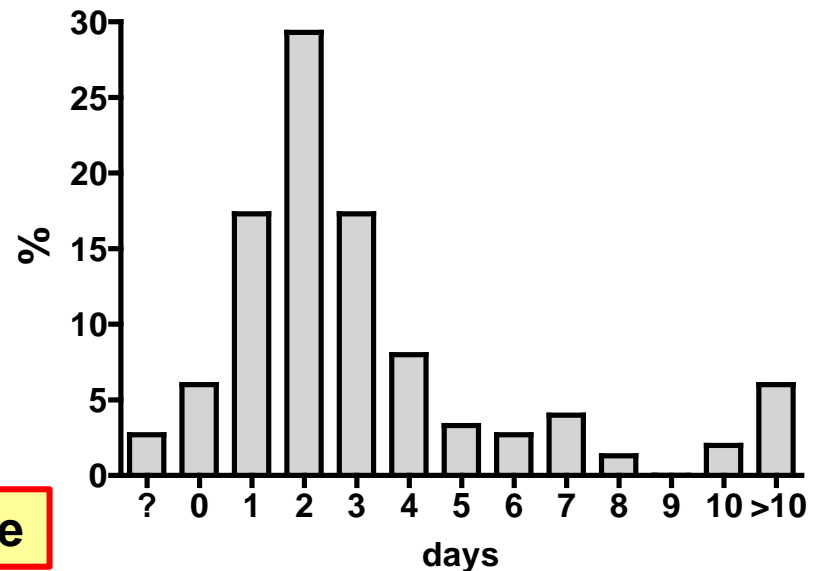
# Qualitative research: Lot Quality Assurance Group: main findings

Main diagnostics (ICPC-2 classification)



those are supposed to be minor infections and often viral

symptom duration at the time of consultation



But patients often come late

# Qualitative research: Lot Quality Assurance Group: main findings

**Main reasons for prescribing an antibiotic against the guidelines and the messages of the public campaigns**

Category	Subcategory
<b>Medical</b>	- perceived severity of the disease or disease considered as requiring antibiotic treatment
	- fragility of the patient or whit risk
	- uncertainty of the etiological diagnostic
	- insufficient time to spend with the patient
<b>Socio-cultural</b>	- patient's demand to which it is difficult to resist
	- provider-client relationship favouring the "delivery of a prescription"
<b>Training and information</b>	- guidelines considered as inappropriate or inapplicable

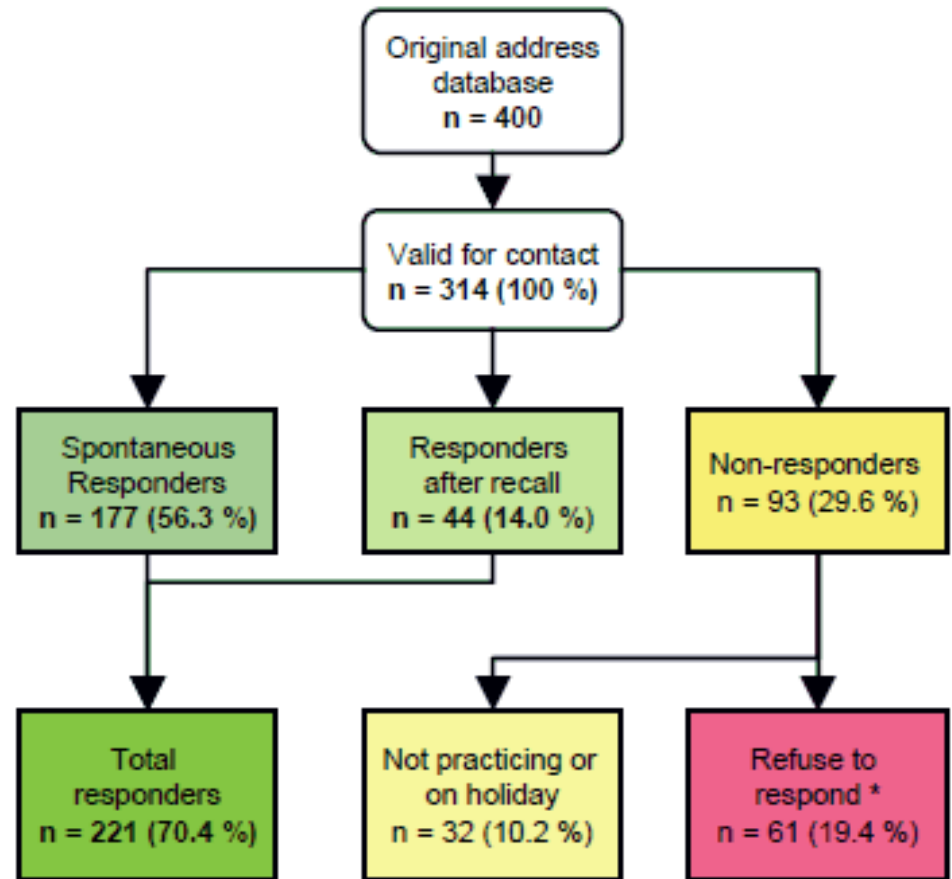
**Not a real surprise...**

# Large scale survey

Self-administered questionnaire sent to practicing GPs (selected at random in French-speaking Belgium [Brussels/Wallonia addressing

- (i) actual practice data;
- (ii) (ii) how the GPs assessed bacterial resistance, official guidelines, public campaigns, feed-back campaigns;
- (iii) questions related to two frequent situations (clinical vignettes: acute sore throat; acute cough) in which antibiotics should normally not be prescribed.

## 1. Response levels (survey validity)



➔ The response rate was high ensuring the validity of the survey with respect to the target population

\* reasons (as expressed; from most to least): Lack of time, too many solicitations for surveys, boring, there is no point, do not feel like answering, Dutch-speaking



# Large scale survey: Results



3. Perception of antibiotic risks and guidelines	
Item (out of 19 included in the analysis)	score
	(-2: fully disagree +2: fully agree)
	-2   -1   0   +1   +2
<b>Antibiotics: resistance and downsides</b>	
A1. Bacterial resistance is rising	
A2. Symptomatic drugs are as effective as antibiotics	
A3. Antibiotics present side effects	
A4. Antibiotics are expensive	
A5. Do you perceive resistance as a problem?	
<b>Official guidelines</b>	
B1. should be made by scientific societies	
B2. should be made by universities	
B3. are conflicting with other recommendations	
B4. are too restrictive	
B5. aim at saving money	
B6. other recommendations also exist	
B7. are up to date	
B8. should be made by Social Security Authorities	

key: ■ median; ■ 25-75 percentile (rounded); | 0.5 -99.5 %

# Large scale survey: Results

## 4. Motivation for antibiotic prescription

Item (out of 47 included in the analysis)	score (-2: least ... +2: most)				
	-2	-1	0	+1	+2
<b>In case of cough</b>					
C1. Frail health status					
C2. I fear some complications					
C3. Presence of sputum coloured					
C4. Unknown patient asking for an antibiotic					
C5. I cannot get a rapid X-ray or other diagnostic tool					
<b>In case of sore throat</b>					
D1. Frail health status					
D2. Second consultation for the same problem					
D3. Patient leaving soon for holidays					
D4. Patient is a young child					
D5. Patient must work					
D6. Unknown patient asking for an antibiotic					
D7. I may use alternative treatments					
D8. Length of symptoms $\leq$ 2 days					

key: ■ median; ■ 25-75 percentile (rounded); |——| 0.5 -99.5 %

# So, why could campaigns be ineffective ?

- Did we address the REAL questions for the doctor ?

→ What is the diagnostic ?

→ What are the risks of not giving an antibiotic ?

→ Will the patient go and see another doctor ?

- and for the patient...

→ am I going to take a risk for my-self ?

→ what for my child, my elder parent, ... ?

# To sum up...

- Public campaigns targeting the public are potentially interesting actions for trying to curb exaggerate use of antibiotics and, thereby, for reducing antibiotic resistance in the community...
- However, there is so far little demonstration of real, important, and long-lasting effects of public antibiotic campaigns on actual antibiotic pressure, and, more critically, on resistance levels...
- The main reasons for failure may be that public campaigns
  - (i) miss the real targets, i.e. the sick patient and the attending physician...
  - (ii) do not address the real questions of importance for these two key actors, such as uncertainty of diagnostic and risk of missing what could be a real threat...