



IMPACT OF REGULATION ON ANTIBIOTICS SALES CHALLENGES AND ACHIEVEMENTS THE EXPERIENCE OF CHILE

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Expert Consultation AMR Washington DC .January 2017

DISCLOSURES

- Meetings: Bayer, GlaxoSmithKline, Merck Sharp&Dohme and Pfizer.
- Advisory Boards: Bayer, Pfizer.
- Conferences: Merck Sharp&Dohme , Pfizer.

No Conflict with the actual conference

ACKNOLEGMENTS

- Dr Manuel Guzman
- Dra Anahi Dresser
- Dr Stephan Harbarth

Rational use of Antibiotics

- **Antimicrobials:** Drugs used in the prevention and treatment of infections caused by pathogenic microorganisms.
- Its use must be linked to a **medical prescription**, since they can present adverse reactions and its use is related to an increase of bacterial resistance
- There is a **relation between antimicrobial consumption in the community and the appearance and spreading of resistance.**

OTC Sales

Illegal OTC antibiotic sale in the EU



**Athens, Greece (174 pharmacies)
2008:**

- 100% of all visited pharmacies sold Amoxicillin/clavulanic acid OTC
- 53% sold Ciprofloxacin OTC, despite extra restrictions for fluoroquinolone prescriptions

Plachouras et al. Euro Surveill. 2010

Non-Prescription Use of Antibiotics

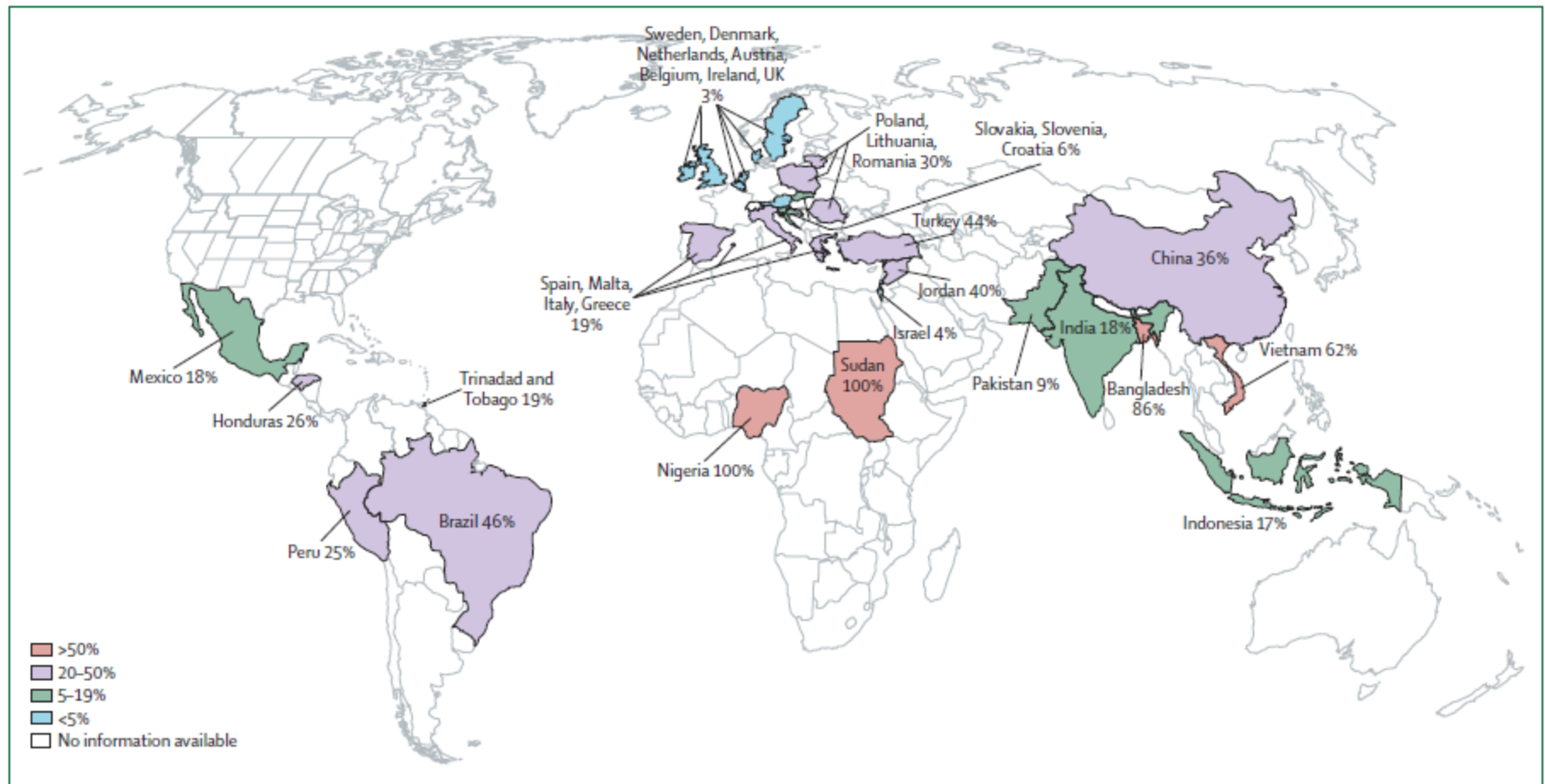
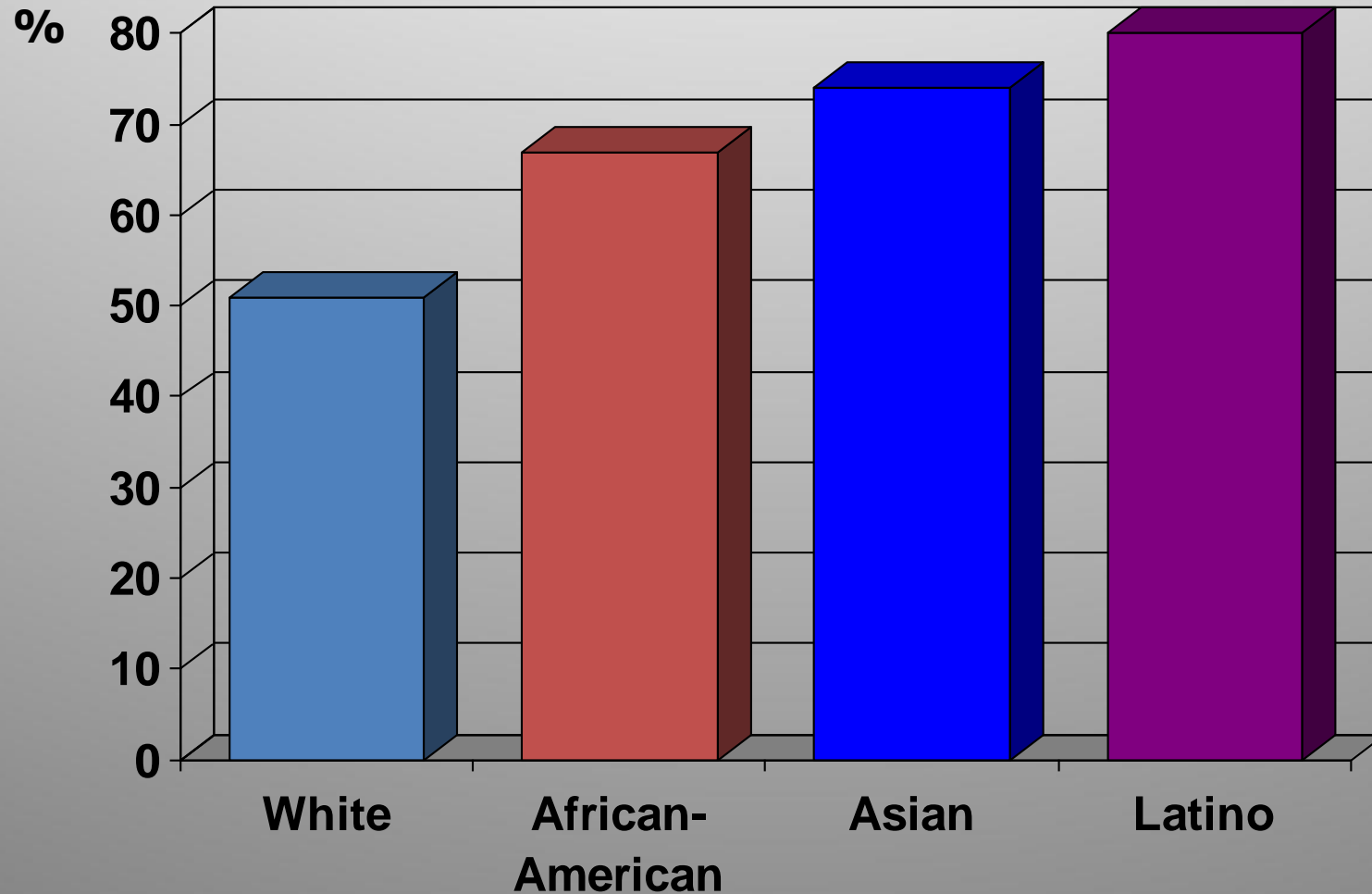


Figure 2: Frequency of non-prescription use of antimicrobials in the general population based on published works
In small areas, countries with similar frequency of non-prescription antimicrobial use have been grouped.

Parents expectation about AB prescription

Anxiety levels according to ethnic variation



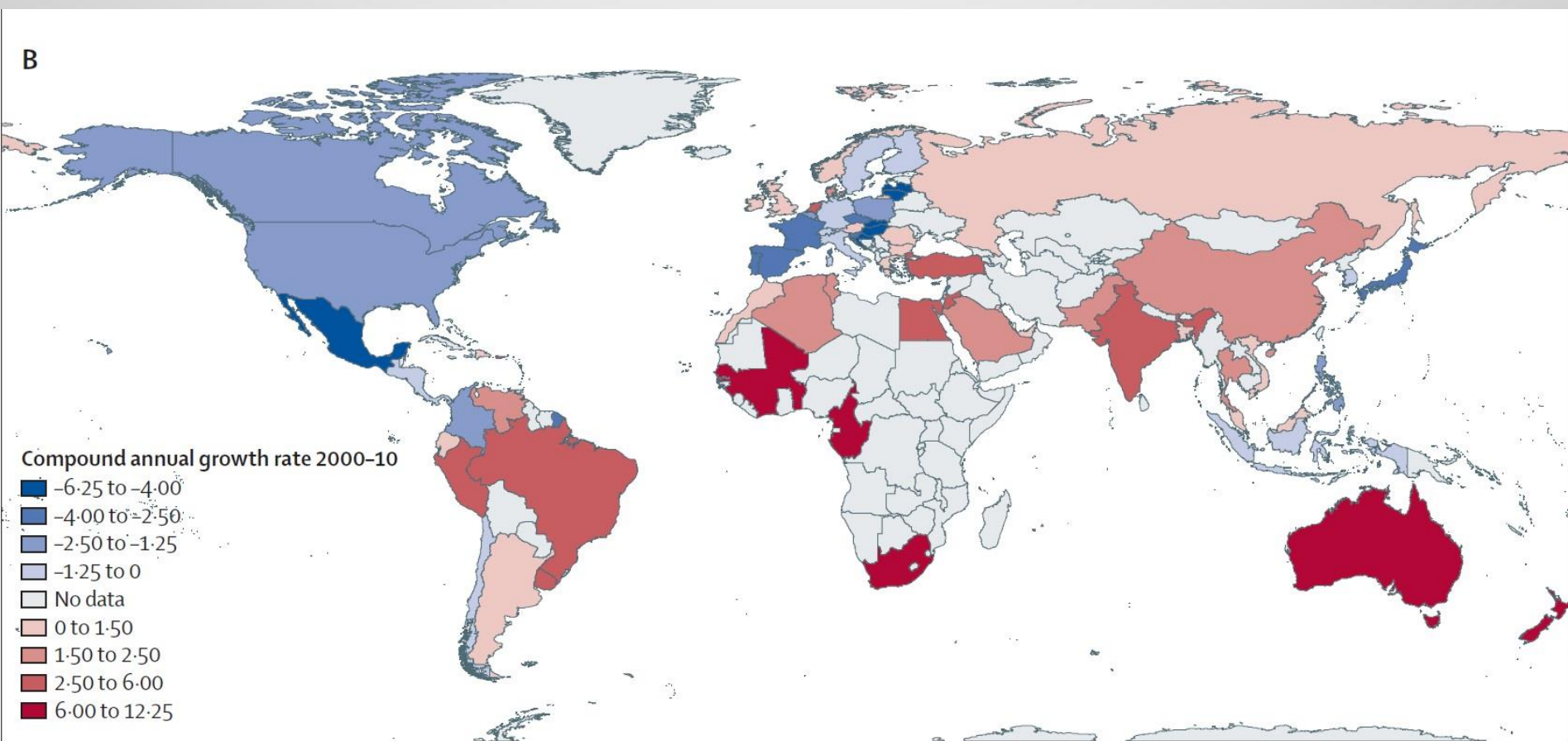


Figure 2: Consumption of antibiotics in 2010

Expressed in standard units (ie, pill, capsule, or ampoule) per person (A), and compound annual growth rate of antibiotic drug consumption between 2000 and 2010 (B)

Latinamerican Data (LA)

- Underestimation of Antibiotic use, in DDD/1000 inhab-day, focused in private-sector consumption.
- LA: Lower values than Europe and USA, where data are related to total consumption.
- Cultural gaps. OTC, incentives, etc.

Background CHILE

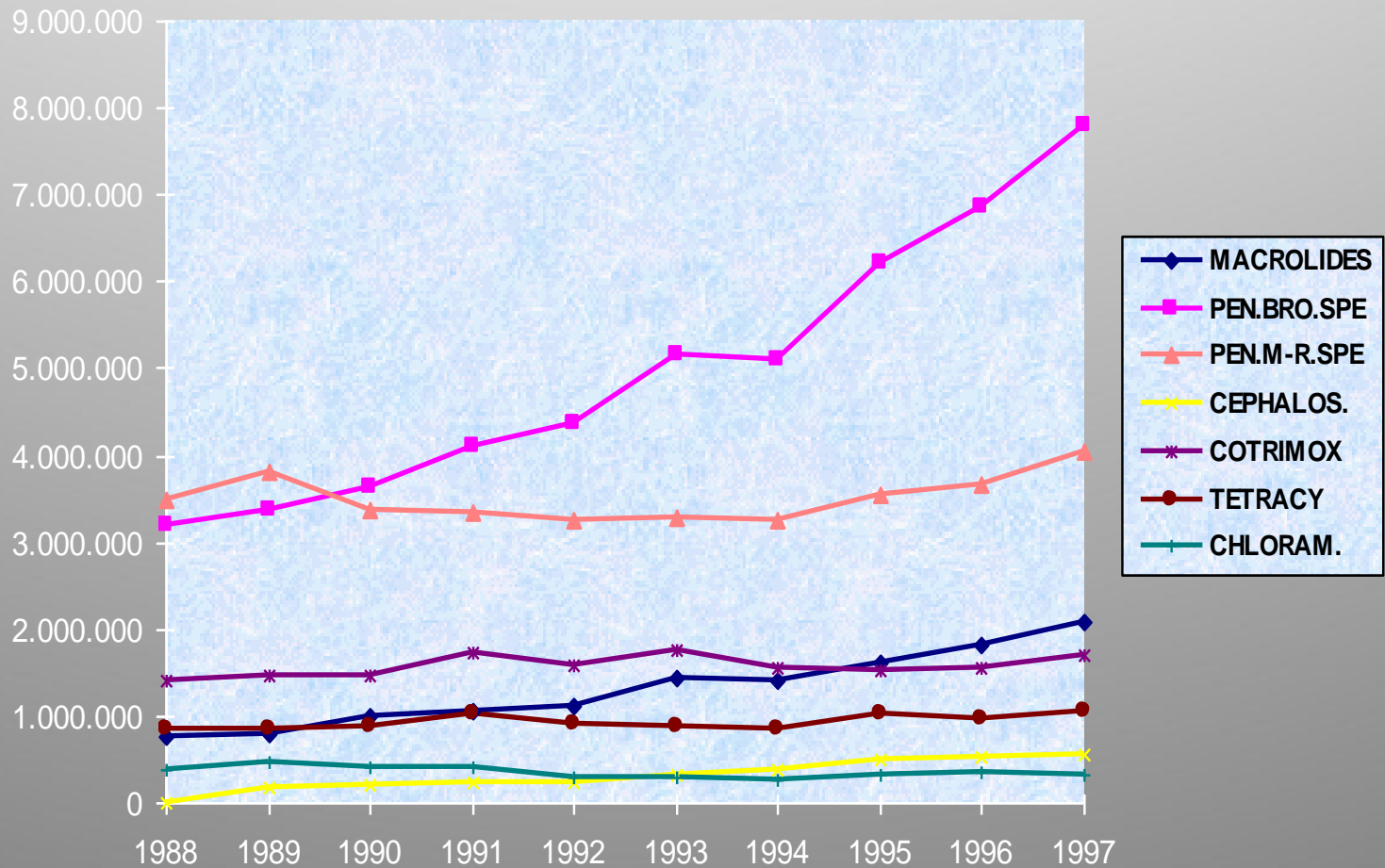
- April, 1998: Infectious Diseases Society - Ministry of Health (Drugs Unit).
- July, 1998: Study of antimicrobial consumption in hospitals and community
- **Study based on sales** that demonstrates a **significant increase** of consumption of antimicrobial from 1988 to 1997.
- December, 1998. Delivery of study results to the Ministry of Health.

Methodology

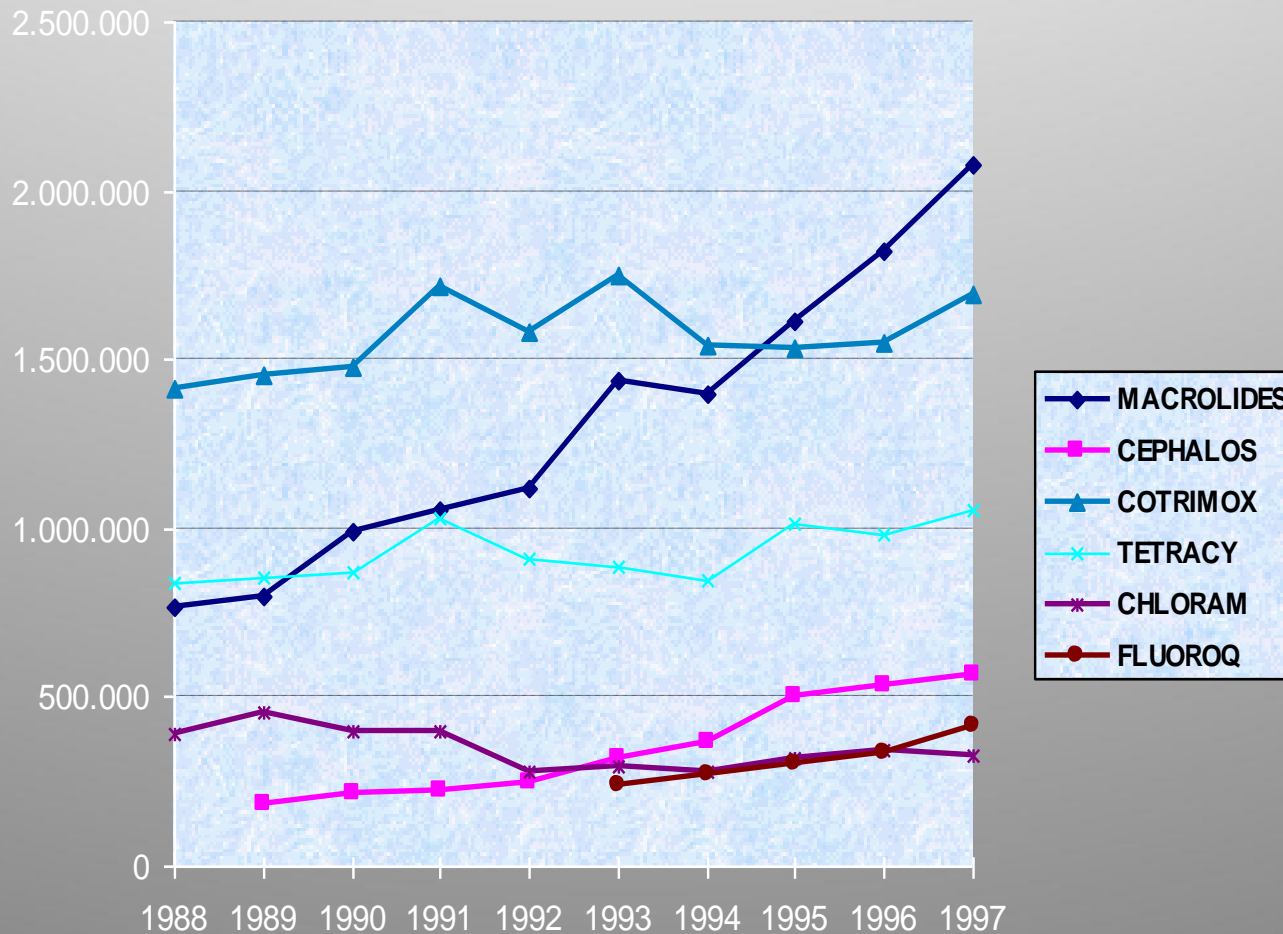
- 1) Census Population Data of Chile. I.N.E.
- 2) Annual sales data for antibiotics I.M.S. 1988 to 1997.
- 3) Definition of the unit of consumption to use
(DDD/1000 pop-day.)
- 4) Calculation of the N° of DDD sold for each antimicrobial:

$$\text{DDD/1000 inh/day} = \frac{\text{sold grams} \times 1000}{\text{DDD} \times \text{N}^{\circ} \text{ days} \times \text{inh}}$$

Units of packages sold between 1988 and 1997



Units of packages sold between 1988 and 1997



Percentage of oral liquid Pharmaceutical Form. Years 1996-1997

ANTIBIOTIC	% from the TOTAL 1996	% from the TOTAL 1997
Clarithromycin	36	28
Azithromycin	22	25
Erythromycin	44	41
Amoxicillin	36	35
Ampicillin	7	7
Clavul. Amoxicillin	52	50
Cefadroxil	36	40
Flucloxacillin	26	23
Cotrimoxazole	24	22

Sale in pharmacies 1988-1996-1997

Comparison in USD

ANTIBIOTIC GROUP	1988	1996	1997
Macrolides	1.599.000	10.790.383	14.745.019
Broad Spe. Pen.	3.062.000	11.606.151	13.869.812
Med/Red Spe Pen.	2.997.000	3.814.038	4.141.114
Cephalosporins	1.601.000	3.692.174	4.275.996
Fluorquinolones	709.000	3.512.470	4.203.548
Cotrimoxazole	1.968.000	2.199.671	2.316.532
Tetracyclines	772.000	1.682.546	2.014.394
Chloramphenicol	319.000	306.255	308.233
TOTAL	13.027.000	37.603.688	45.874.648

Conclusions

- **A significant annual increase in the consumption of antimicrobials drugs in the community of Chile.**
- The group of greater increase is the one of broad spectrum oral Penicillins, ie, Amoxicillin.
- The groups of recent appearance show a high use pattern.
- **A high consumption of antimicrobials is presumed in the pediatric population.**

What to do with this reality?

With the results and conclusions of the study, the authors with the Ministry of Health through their Drug Unit looked for strategies to favor the rational use of the antimicrobials.

Work Meetings

April -June 1999: meetings in Ministry of Health, altogether with:

- **Chilean Infectious Diseases Society**
- **Chilean Microbiology Society**
- **Chilean Pharmacology Society**
- **Public Health Institute**
- **Professional Organizations of Physicians and Chemists**
- **Committee on Health of the National Congress**
- **National Department of Consumer Affaires**

People were used to buy antibiotics without a prescription, and even individual tablets in Chile's pharmacies

Regulatory measures

- **September, 1999: The Medical Association and Pharmacist Association publicly supported the rational use of antimicrobials.**
- **Document 4C/5051 of the Ministry of Health:**

"Action plan to assure the rational use of antimicrobials".

Action Plan

Content of the action plan:

- **Fulfillment of the antimicrobial sale restriction (only through Chemist and on prescription).**
- **Population Information:** leaflets and posters in private Pharmacies.
- **Extensive coverage on radio and television news**
- **Education campaign.**
- **Test the compliance of the sale restriction.**
- **Sanctions whent it concerns, inicallylly educatives**

mil muertos deja
o en Turquía

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Los empleos que ofrece
el plan del Gobierno

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EXIJA HOY
"Grandes
Hechos Históricos
de la Humanidad"



\$200 • Regiones I, II, XI y XII: \$240 • Año XCVII • N° 31.996 • Miércoles 18 de agosto de 1999

Las Últimas Noticias

MEDIDA SE APLICARÁ A PARTIR DE SEPTIEMBRE

Exigirán receta para comprar antibióticos

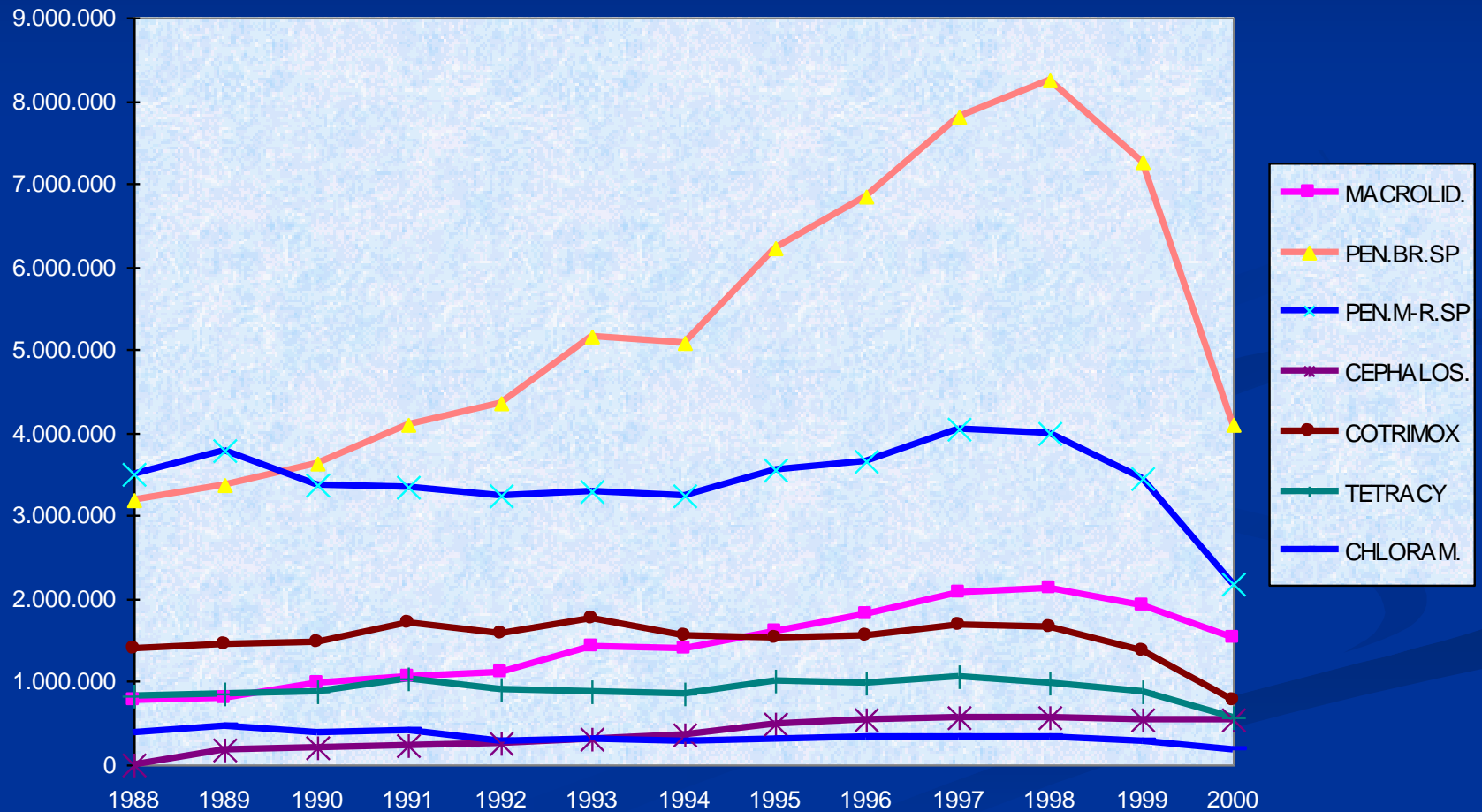
Afecta, entre otros, a la amoxicilina y a la eritromicina



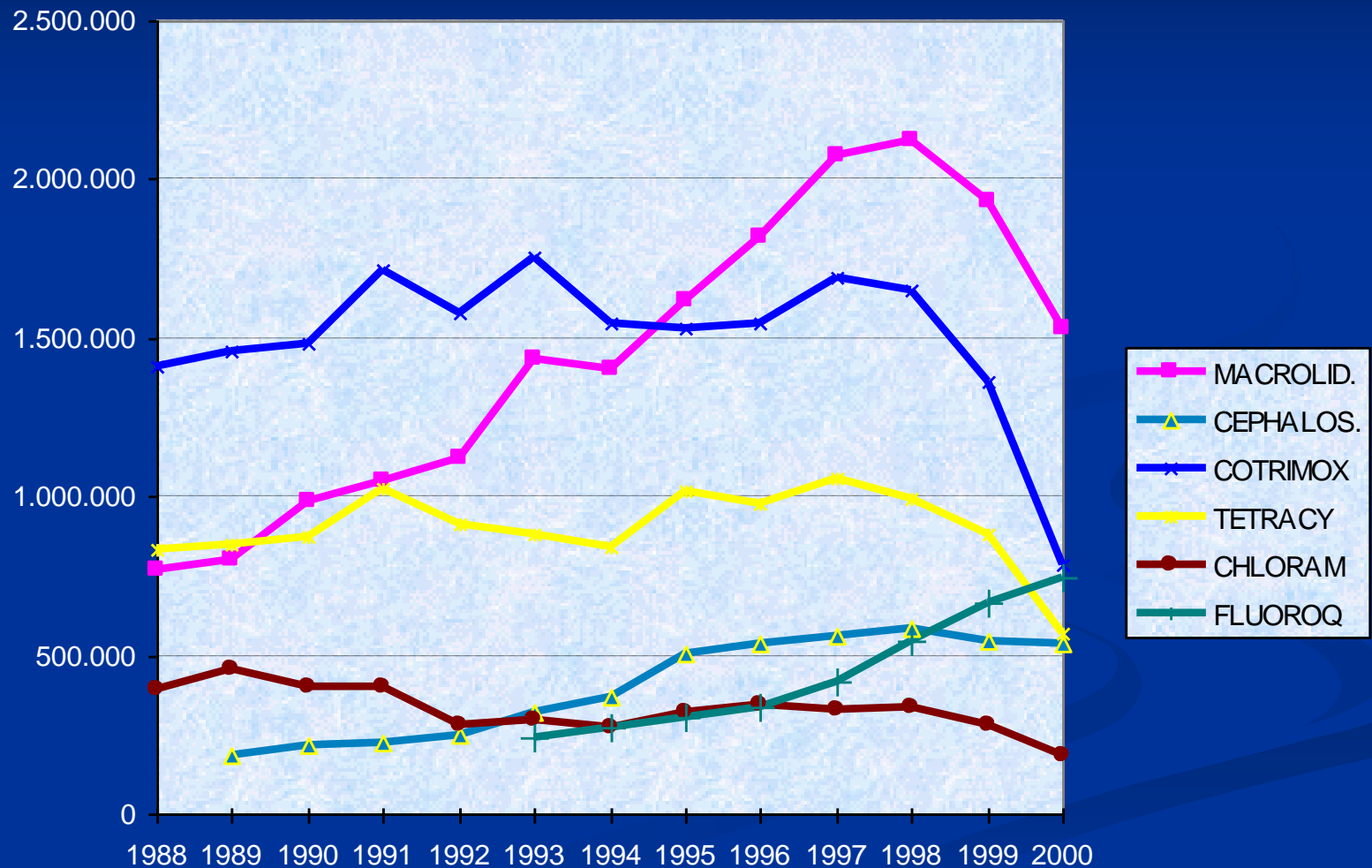
What happened with the consumption?

- To determine if the regulatory measures of the Ministry of Health, had an immediate impact in the community consumption of antimicrobials.
- To determine the economic impact of such measures, expressed in US dollars.

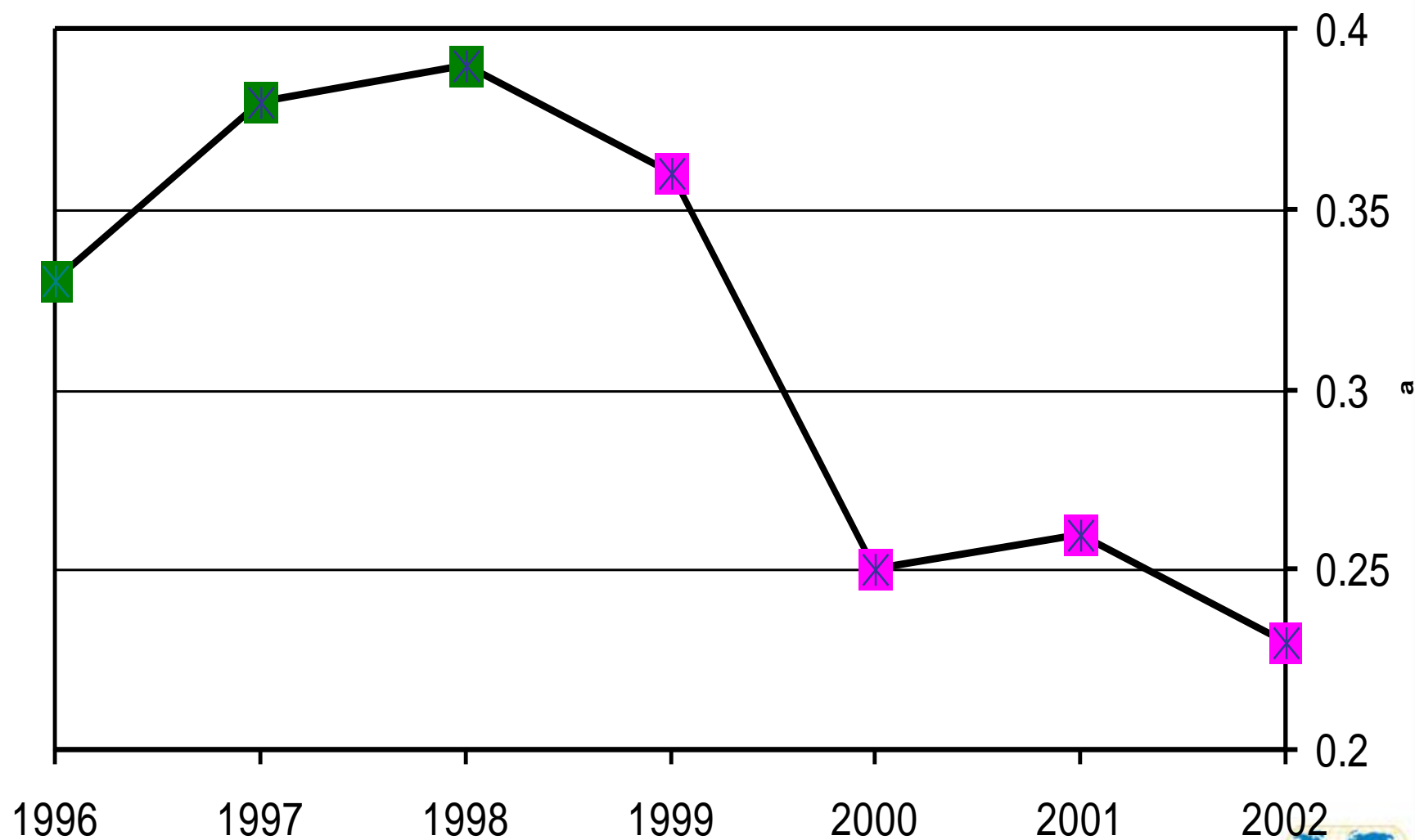
Units of packages sold between 1988 and 2000



Units of packages sold between 1988 and 2000

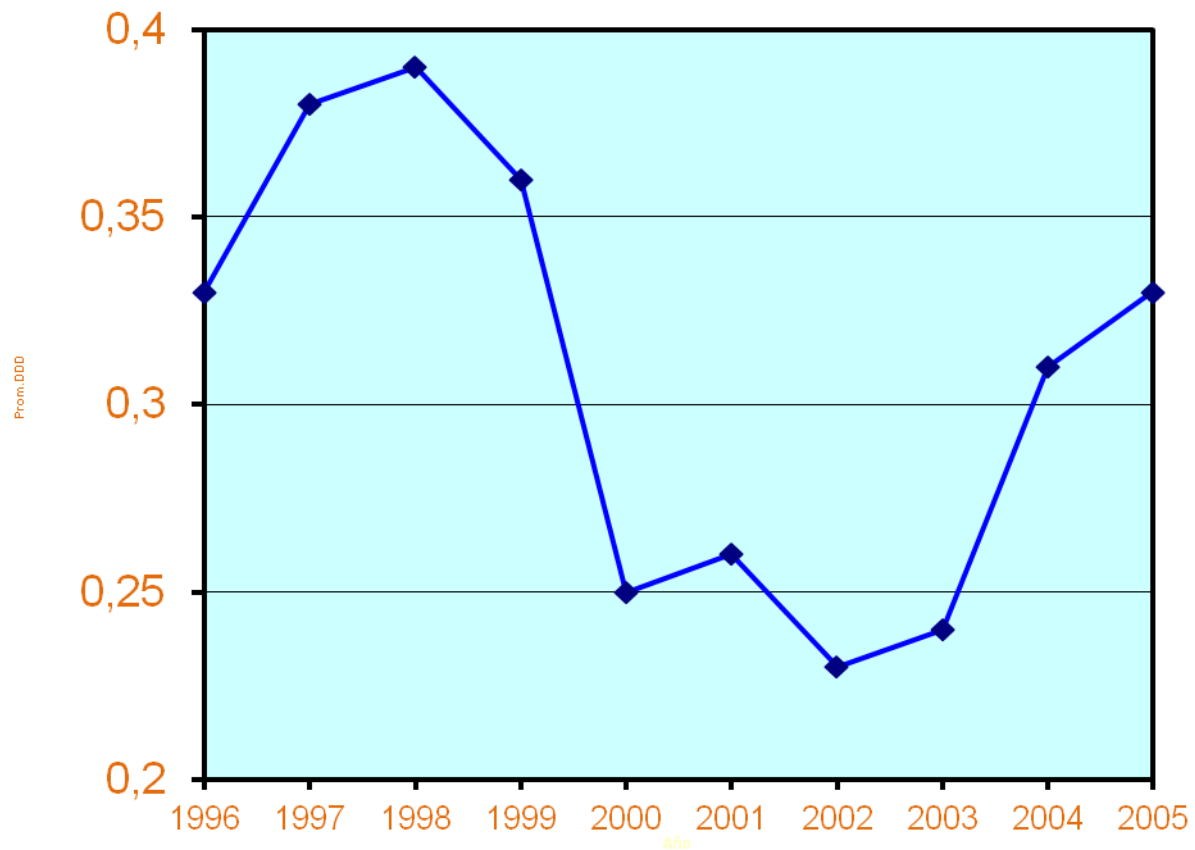


Graph 1: Consumption average in DDD/1000 inh-day for year 1996-2002

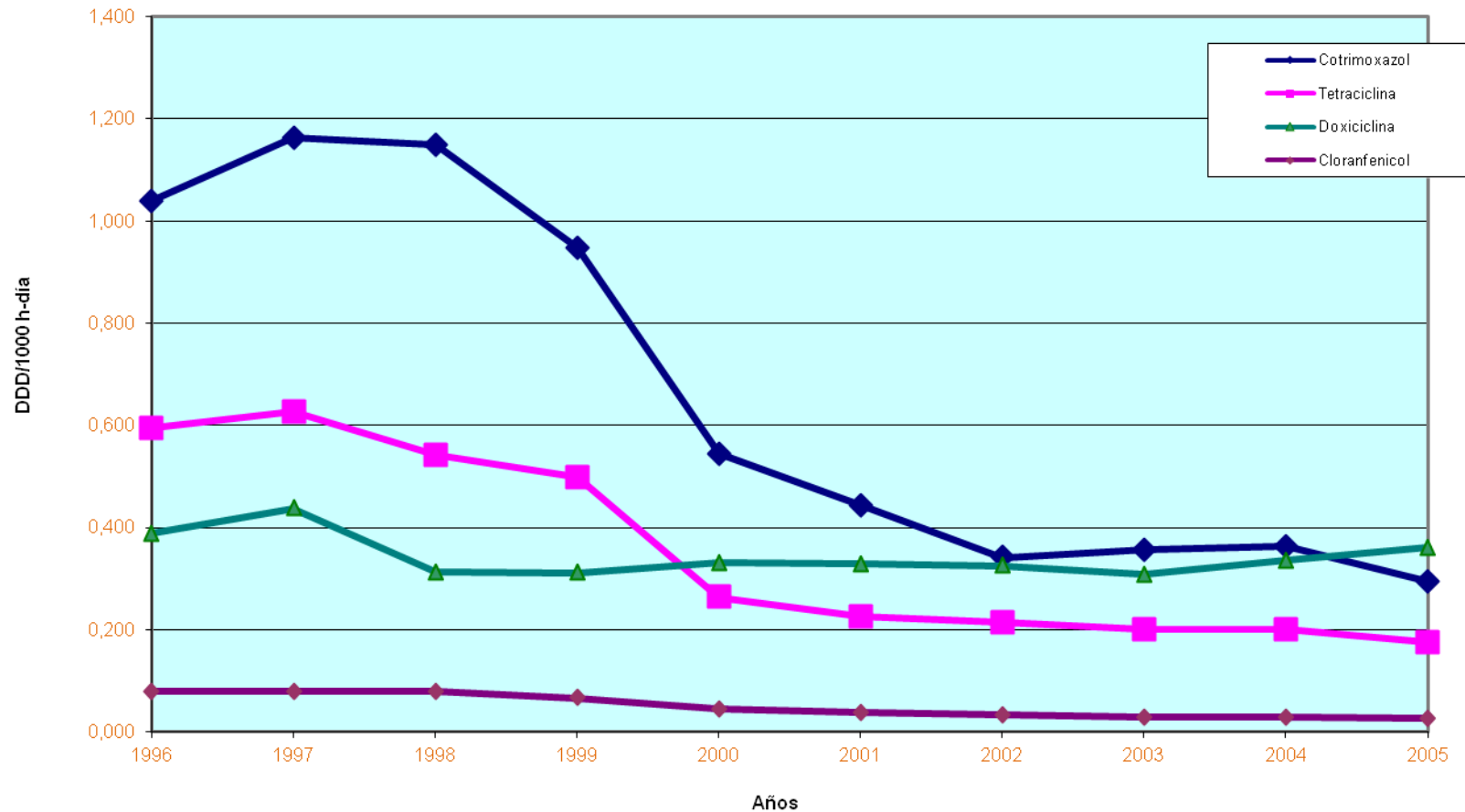


After the Success...

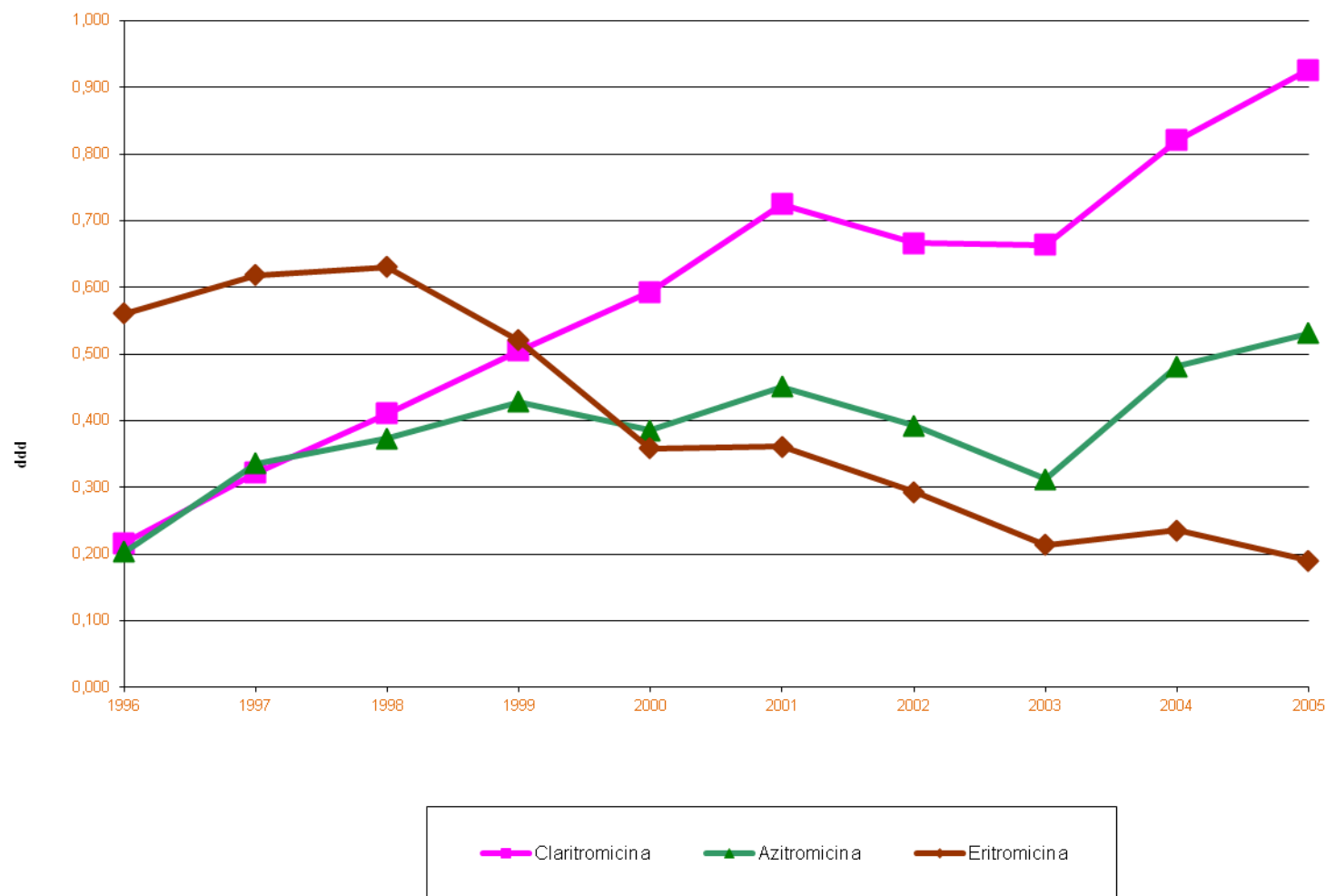
Average DDD/1000 inhab-day CHILE



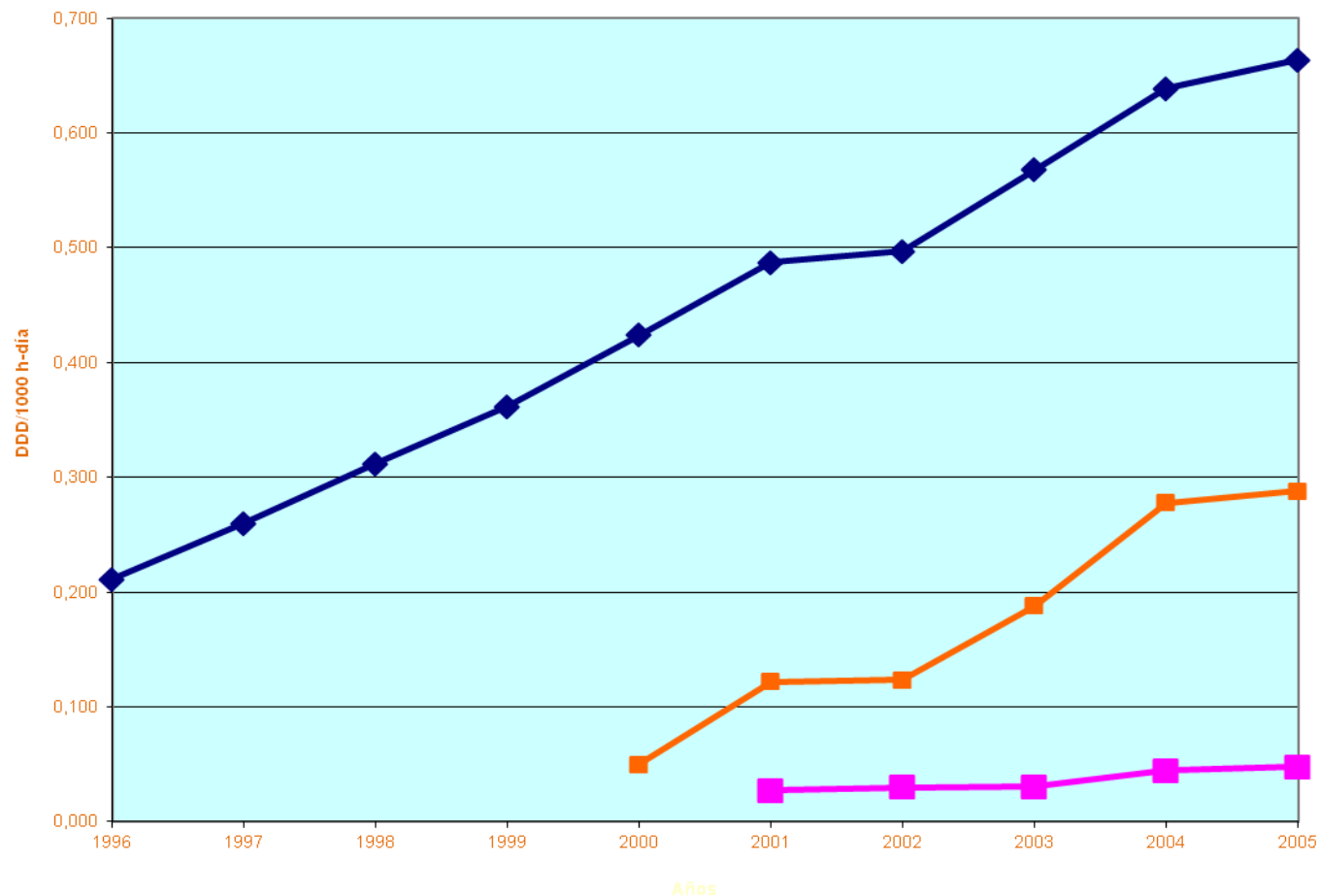
Bactrim, Tetracycline, Chloramphenicol Doxycycline



Macrolides (DDD/1000 inhab-day)



Quinolones (DDD/1000 inhab-day)

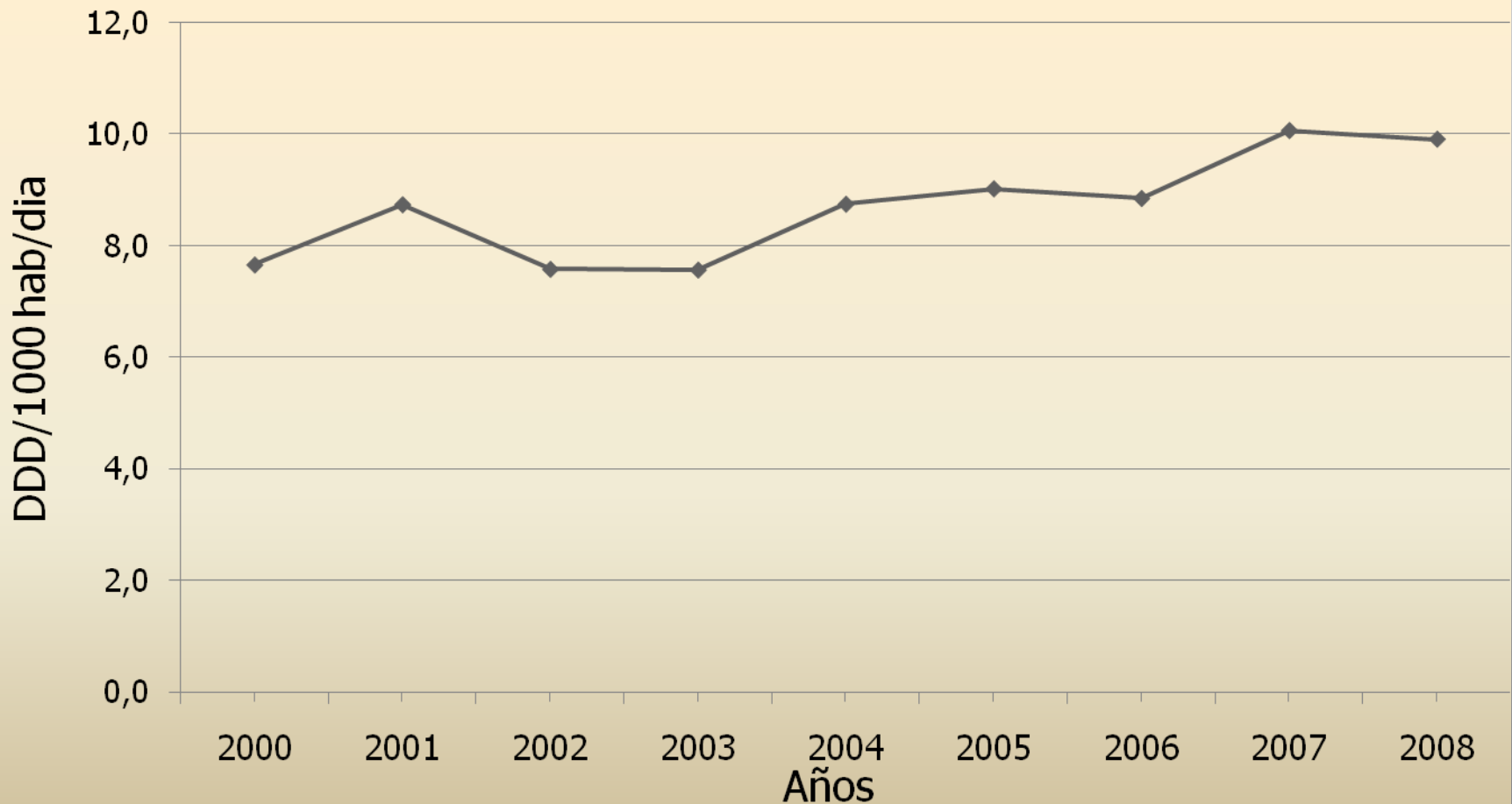


—◆— Ciprofloxacin

—■— Moxifloxacin

—■— Levofloxacin

TOTAL DDD/1000 INHABITANT-DAY. CHILE 2000-2008.



Conclusions

- After the initial success, we are returning to the previous antimicrobial community consumptions.
- The Antimicrobial groups traditionally **prescribed by physicians were not** affected by the measures.
- **(New Macrolides, Fluoroquinolones)**
- Actual situation .new measures- continue education

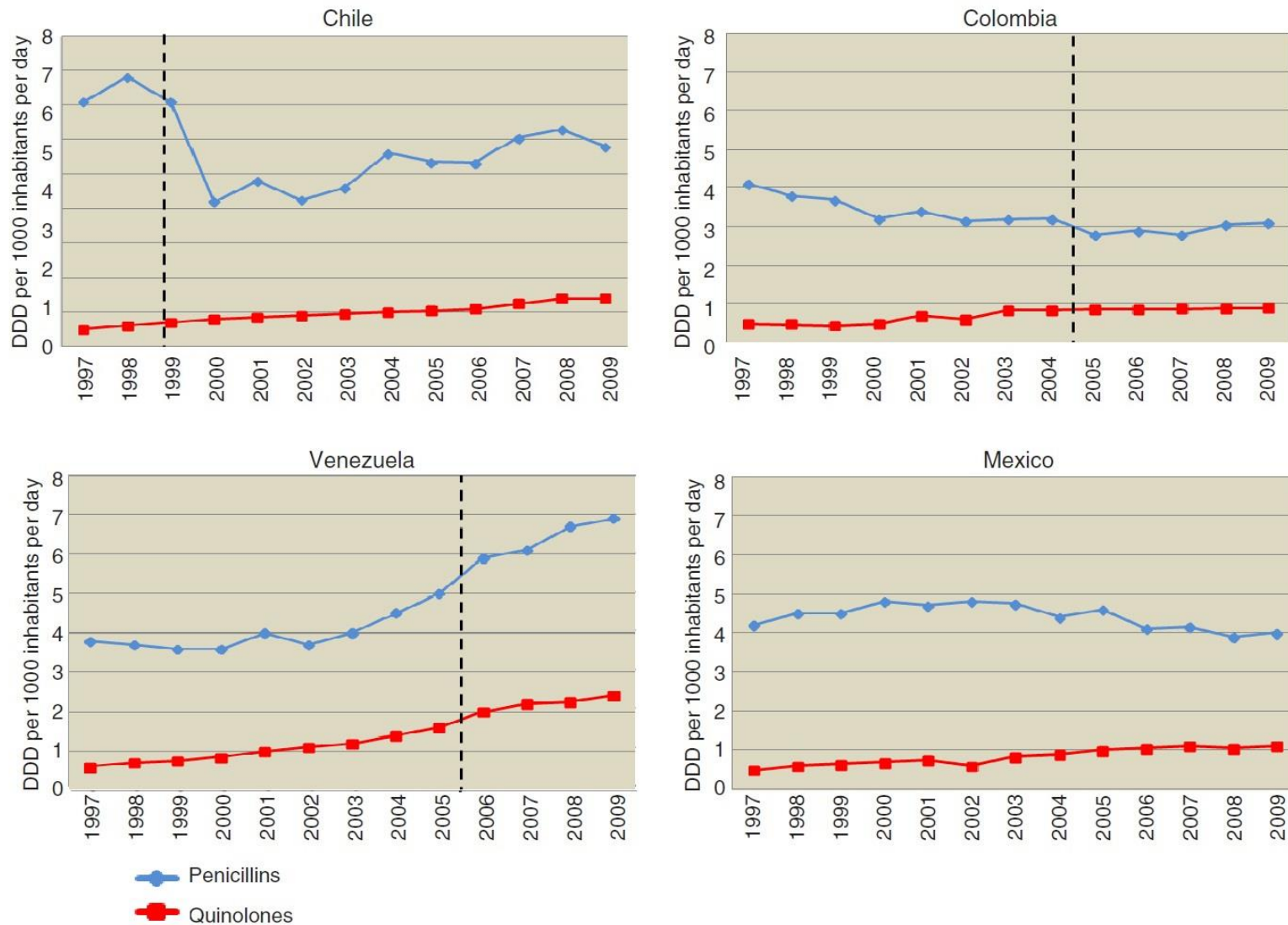
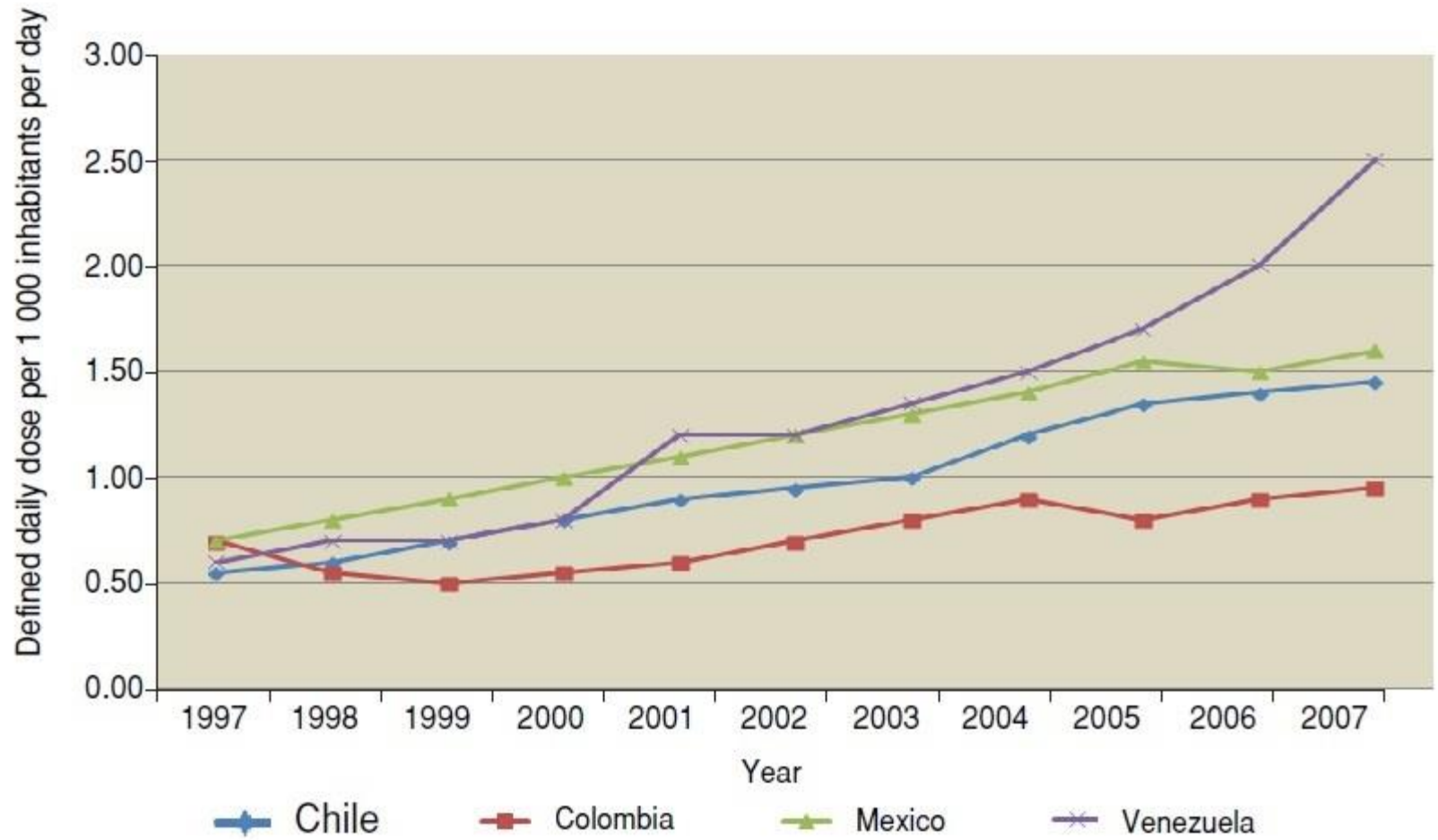


Figure 2 Antibiotic consumption by therapeutic group in Chile, Colombia, Venezuela and Mexico in DDD per 1 000 inhabitants per day. The dotted lines indicates the dates of policy implementation.

Ajusted from V.J. Wirtz et al, TMIH, 2013

FIGURE 5. Quinolone utilization in eight Latin American countries, 1997–2007



Conclusions

- **Trend in global AM consumption is to increase ,and in low resources setting is even worse, as the AM resistance as well**
- **An Urgent intervention is needed, and to succeed, it's mandatory political determination, public consultation and education on effective measures.**
- **The success in the long term program depends on the compliance, maintenance, surveillance and control of these measures by all involved parts,including physicians, prescriptors,chemists and community in general.**

Bacteria are truly global players
and seem to have better
strategies than we have on a
global level!