



volume 11 issue 7

July 2010

Home Page

[Back to Home Page »](#)

Contents

Infants should not be given honey due to botulism risk

Outpatient Antibiotic Use in Ireland, 2009

New Surgical Infection Prevention Website

Continued decrease in hospital antibiotic usage rates

Opinions sought on guidelines for the prevention of ventilator-associated pneumonia

Antimicrobial consumption point-prevalence study 2009 results from Irish hospitals

Legionnaires' disease and windscreen wiper fluid

HPSC takes further step to make information freely and widely available

Latest HPSC reports

Editorial Board

Outpatient Antibiotic Use in Ireland, 2009

Summary

In 2008, outpatient antibiotic consumption in Ireland declined for the first time since 2000. Despite a brief increase during a moderately severe seasonal influenza period in December 2008/January 2009, antibiotic consumption continued to decline in 2009. During the pandemic influenza period in late 2009, antibiotic consumption increased in line with historical trends, but fell to a lower level than expected in December 2009. If the decline in usage continues to follow the recent trend, antibiotic consumption in Ireland is projected to fall to 2004 levels in 2010. The reduction in antibiotic consumption is probably related to General Practitioner (GP), patient and public education campaigns on prudent antibiotic use. Reducing unnecessary antibiotic use is required to combat the increasing public health threat of antimicrobial resistance. In addition, the reduction in antibiotic consumption provides considerable financial savings in drug prescribing costs.

Introduction

Surveillance of antimicrobial usage has been identified as a key component in the WHO Global Strategy of Containment of Antimicrobial Resistance and the Strategy for the control of Antimicrobial Resistance in Ireland (SARI). Ireland participates in the European Surveillance of Antimicrobial Consumption (EASC) project, which aims to construct an inventory of antibiotic usage in the EU at national level by collating data from both outpatient (primary care or community) and hospital care areas.

In an ESAC report of outpatient antibiotic consumption from 29 EU countries with reliable data for 2005, the range of outpatient antibiotic usage was 9.2 Defined Daily Doses per 100,000 Inhabitants (DID) (Russian Federation) to 34.7 DID (Greece). The median for all countries was 18.1 DID.¹ Outpatient antibiotic usage in Ireland has been around 19 - 23 DID over the last five years. Thus the overall rate in Ireland is mid-to-high in Europe. Furthermore, the ESAC report also highlighted that Ireland was one of only four countries where the trend in consumption was increasing while six of the remaining 25 countries showed a decrease in usage.

As part of SARI, a GP educational programme on prudent antibiotic prescribing commenced in 2004, and has been steadily extended to GPs in all areas over the past 2-3 years. In addition, the first-ever European Antibiotic Awareness Day (EAAD) took place across Europe on Tuesday 18th November 2008.² HPSC, the SARI Community Antibiotic Stewardship working group, and HSE Communications, put in place a number of initiatives around this day, including:

- a scientific seminar and press briefing on prudent antibiotic use
- a radio, print and outdoor advertising public information campaign
- distribution of educational material through health centres, community pharmacies and other outlets

Subsequent post-marketing surveillance showed an increased level of awareness of the importance of

Dr D O'Flanagan, HPSC
(Managing editor)
Dr L Kyne, RCPI (Paed)
Prof C Bradley, ICGP
Dr N O'Sullivan, ISCM
Mr E O'Kelly, NVRL
Dr P McKeown, HPSC
Dr L Thornton, FPHMI
Dr C Bergin, IDSI
M Kelly, HPSC
(Editor)

Health Protection Surveillance Centre

25-27 Middle Gardiner St
Dublin 1

Tel: +353 (0) 1 8765300
Fax: +353 (0) 1 8561299
info@hpsc.ie
www.hpsc.ie

Contents of Epi Insight should
not be reproduced without
permission.

© HPSC, 2010. All rights
reserved

Subscribe

Enter your email address in the
box below to receive an email
each time we post a new issue
of our newsletter.

Email Address:

Email Format:

avoiding unnecessary antibiotic use among respondents.

The overall outpatient antibiotic consumption for Ireland in 2008 was 21.5 DID, a decrease from the previous year's rate of 22.4 DID, the first time the yearly trend has decreased since 2000.³ Furthermore, a significant decrease in antibiotic consumption was seen for the month of November in 2008, around the time of the first EAAD. However, following a moderately severe influenza season in winter 2008/2009 there was concern that the decline would not be sustained. Media briefings and recirculation of educational material took place around the second EAAD in November 2009, but the public information campaign could not be repeated, due to budgetary constraints.

This is a report of the changes in antibiotic consumption rates as affected by the two EAADs and the possible counter effects of the last two periods of high influenza activity.

Methods

HPSC has purchased Irish antibiotic sales data from IMS Health, a pharmaceutical market research company. This dataset contains regional, monthly wholesaler to retail pharmacy sales data from over 95% of the wholesalers and manufacturers in Ireland. Consumption is measured in Defined Daily Dose (DDD), which is the assumed average maintenance dose per day for a drug used for its main indication in adults. The current WHO Anatomical Therapeutic Chemical index was used to classify the antibiotics.⁴

Rates were calculated in DDD per 1000 inhabitants per day (DID) for the outpatient antibiotic consumption data. Updated population size estimates were obtained from the Central Statistics Office⁵ and used to calculate monthly rates.

Monthly expected usage values for 2000-2008 were calculated from time-series data using an exponential smoothing (Holt-Winters) model and projections were obtained for the 12 months of 2009 using the same model. Simple linear regression was used to study whole yearly rates thus: 2000-2008 for estimating expected usage for 2009; 2007-2009 for estimating a revised projected usage rate for 2010.

Results

Overall outpatient antibiotic consumption for 2009 was 20.8 DID. This is a decline of 3.4% from the rate in 2008 of 21.5 DID. The observed rate for 2009 was 8.5% lower than the expected rate, as projected from the historical trend from 2000 to 2008. As shown in figure 1, a revised trend from 2007 to 2009 shows a projected use for 2010 at a level similar to 2004.

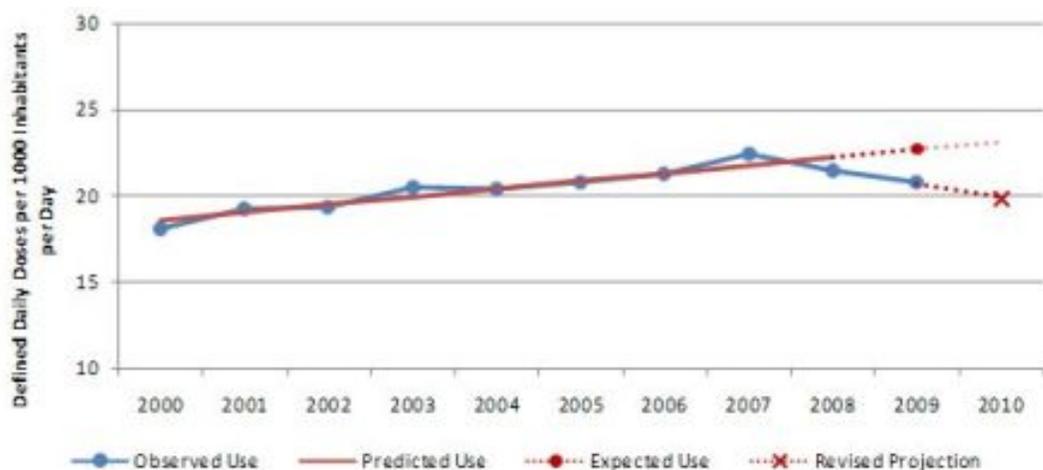


Figure 1. Graph showing yearly outpatient antibiotic usage rate in defined daily doses per 1000

inhabitants per day.

In figure 2, the expected usage rate for 2009 is a projection of the time-series model based on 2000 to 2008 data (only 2007 January – 2009 December are shown for clarity). The blue arrows indicate the European Antimicrobial Awareness Days that took place on the 18th of November in 2008 and 2009. The green horizontal bars represent periods of high influenza activity. Influenza activity in season 2007/2008 was relatively mild compared to the 2008/2009 season.⁶

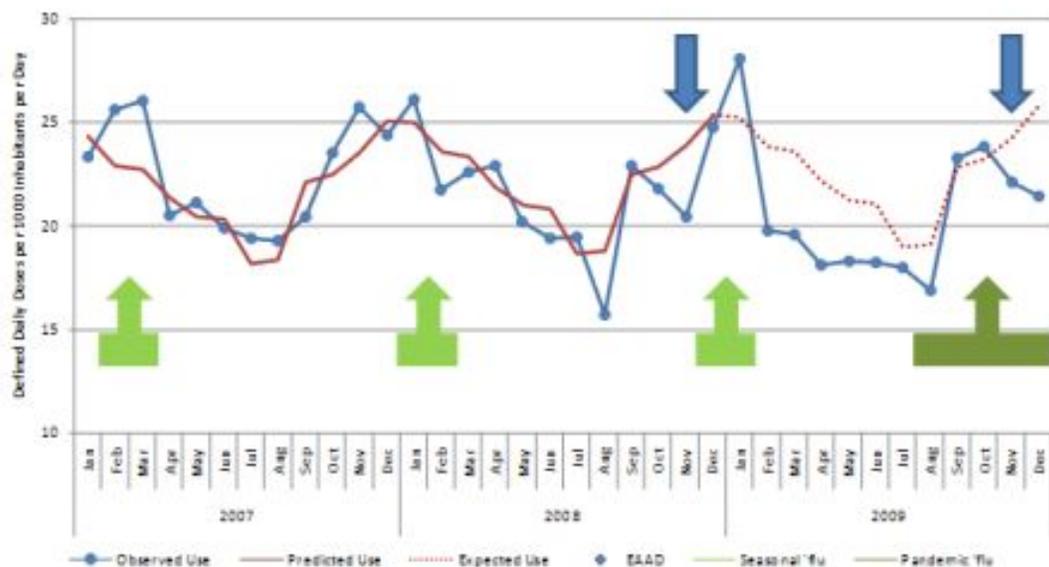


Figure 2. Graph showing monthly outpatient antibiotic usage rate in defined daily doses per 1000 inhabitants per day.

Figure 3 shows that penicillin in combination with beta-lactamase inhibitor (such as co-amoxiclav) accounted for the largest proportion of penicillins. This group of antibiotics had been showing a dramatic rise in recent seven years (2000-2008), however, 2009 was the first year a decrease was observed (5.5 DID in 2009 from 5.6 DID in 2008, a 2% drop). Broad-spectrum penicillin (such as ampicillin and amoxicillin) usage was stable but showing a slight decline. Beta-lactamase resistant penicillin (such as flucloxacillin) and narrow-spectrum penicillin (such as benzylpenicillin) usage were lower but showed slight increases.

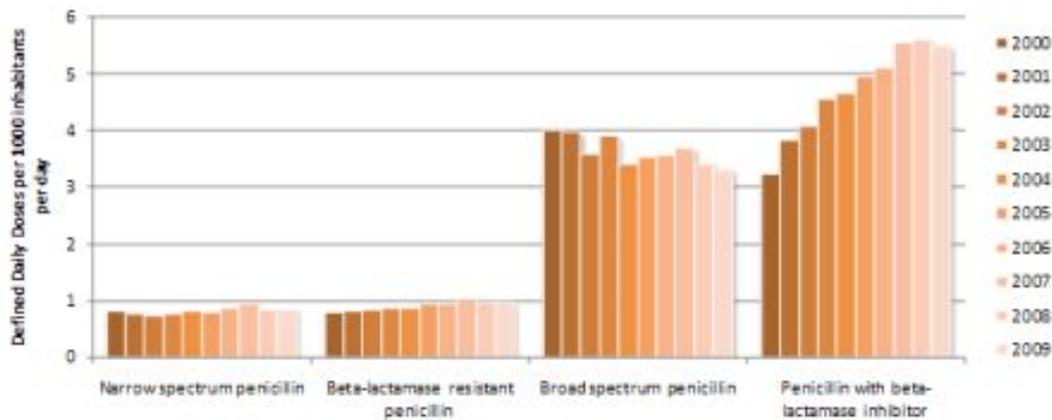


Figure 3. Graph showing yearly consumption rates of chemical subgroups of penicillin antimicrobials

Discussion

It is encouraging that the overall outpatient antibiotic consumption for 2009 was 20.8 DID, a decline of 3.4% from the rate in 2008 of 21.5 DID. It is likely that the GP education programme and interventions that took place around the European Antibiotic Awareness Day (EAAD) in November 2008 had an effect on lowering the antibiotic consumption rate.

Despite this effort, antibiotic consumption rate did increase at certain time periods during 2009. In a separate analysis of recent Irish data, it was shown that outpatient use of specific antibiotics is strongly associated with seasonal influenza activity.⁷ The 2008/2009 seasonal influenza activity was the highest in the previous nine years with the influenza-like illness (ILI) rate at over 120 consultations per 100,000 population. It is therefore likely that the high antimicrobial use in January of 2009 was, at least partly, a result of inappropriate prescribing for respiratory viral infections.

Antibiotic consumption rates for the following seven months of 2009 were considerably lower than estimates based on the historic trend, and again, it is likely that this is a result of the interventions. However, the rate for September and October 2009 returned to levels in line with expected rates forecast from the historical trend. Influenza 2009 H1N1 Pandemic, which resulted in a peak ILI rate of over 200 consultations per 100,000 and lasted over 20 weeks, may be the reason for this return to former levels.

The marked seasonal fluctuation coupled with a higher proportion of broad-spectrum penicillin consumption in Ireland is consistent with those countries having a higher level of resistance among key indicator pathogens, as in Portugal and Italy, unlike the Nordic countries, which generally have low levels of resistance. In Ireland proportion of invasive *Streptococcus pneumoniae* isolates that are penicillin non-susceptible (PNSP) has been steadily increasing and is at 23.1% for the updated 2008 data.³ Furthermore, high-level penicillin resistance (6.1%) in invasive pneumococcal isolates in Ireland is among the highest in Europe. Penicillin in combination with beta-lactamase inhibitor (such as co-amoxiclav), which account for the largest proportion of penicillins, for the first time showed a decrease in usage (5.5 DID in 2009 from 5.6 DID in 2008, a 2% drop). Broad-spectrum penicillin (such as ampicillin and amoxicillin) usage was high but showed a slight decline. Preliminary analysis of the 2009 antimicrobial resistance data⁸ has shown a slight decrease in PNSP levels in Ireland, which may be related to the decrease in antibiotic consumption, coupled with the introduction of the conjugate pneumococcal vaccine into the routine childhood immunisation scheme.

A revised trend from 2007 to 2009 showed a projected use for 2010 at a level similar to 2004. Such a sustained reduction should contribute to a stabilisation or reduction in the level of antimicrobial resistance, as well as producing savings of millions of Euro in drug prescription costs to both private patients and to the reimbursement services. Ongoing GP, patient and public education programmes are required, to continue to reduce excessive antibiotic use. In light of the finding of increased antibiotic consumption during periods of increased influenza activity, education campaigns should, in particular, target unnecessary antibiotic use for respiratory viral infections.

Ajay Oza, Robert Cunney HPSC

References

1. Muller A., S. Coenen, D. L. Monnet, H. Goossens, and ESAC project group. *European Surveillance of Antimicrobial Consumption (ESAC): outpatient antibiotic use in Europe, 1998-2005*. Eurosurveillance weekly releases 2007, 12(10): 1-7.
2. Earnshaw S., D. L. Monnet, B. Duncan, J. O'Toole, K. Ekdahl, H. Goossens, the European Antibiotic Awareness Day Technical Advisory Committee, the European Antibiotic Awareness Day Collaborative Group. July 2009. Eurosurveillance Vol 14.
3. HPSC Annual Report 2008. Available [here](#).
4. ATC/DDD Index. Oslo, Norway: WHO Collaborating Centre for Drug Statistics Methodology. Available [here](#).
5. Population and Migration Estimates: April 2009. Central Statistics Office. 22 September 2009. ISSN

1393-5593.

6. Influenza Surveillance Reports. Available [here](#).
7. Oza A., L. Domegan, K. Hunter, S. Jackson, M. Joyce, J. O'Donnell, R. Cunney and D. O'Flanagan. Association between Outpatient Antibiotic Use and Seasonal Influenza Activity. June 2008. IDSIPH Poster, Dublin.
8. EARSS Quarterly Surveillance Reports – 2009. Available [here](#).

TELL A FRIEND

The views expressed in Epi Insight are those of the individual contributors and not necessarily those of HPSC. All reasonable efforts have been made to ensure that all information is accurate at the time of publication. The HPSC will not be liable for any loss, injury or incidental special, indirect or consequential damage or defamation arising out of, or in connection with, Epi Insight or other material derived from, or referred to in the publication.

Created with
[Newsweaver](#)