Tuberculosis: current problems

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Introduction

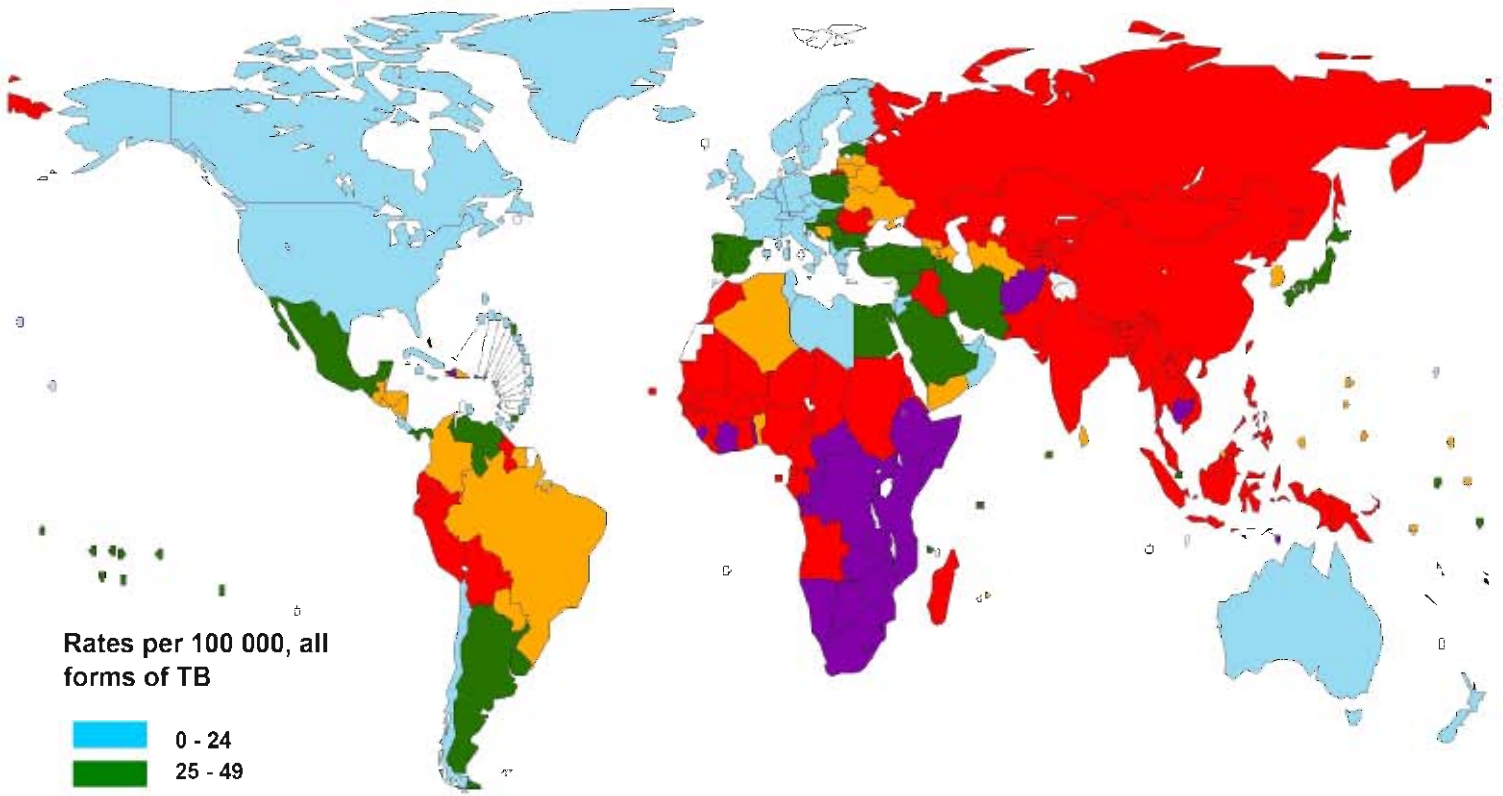
- Tuberculosis remains a global public health problem
- **Tuberculosis kills nearly two million people a year** mainly in the poorest communities in the developing countries
- About **one third of the world's population is infected** with TB
- Nearly **nine million new cases develop every year**
- The estimated incidence of Smear positive pulmonary TB is up to **62 /100 000** population. In Sub Saharan Africa, it reaches **149 /100 000** inhabitants

Tuberculosis in the world (2005 WHO *Global report)*

	1000s population	Rate/100 000
Global population	6 298 890	
Incidence: all cases	8, 810	140
M+ PT	3, 897	62
Mortality	1, 747	28

Rate of TB among HIV infected people	*9%*
Death among HIV infected people	*12 %*

Estimated TB incidence rate, 2003



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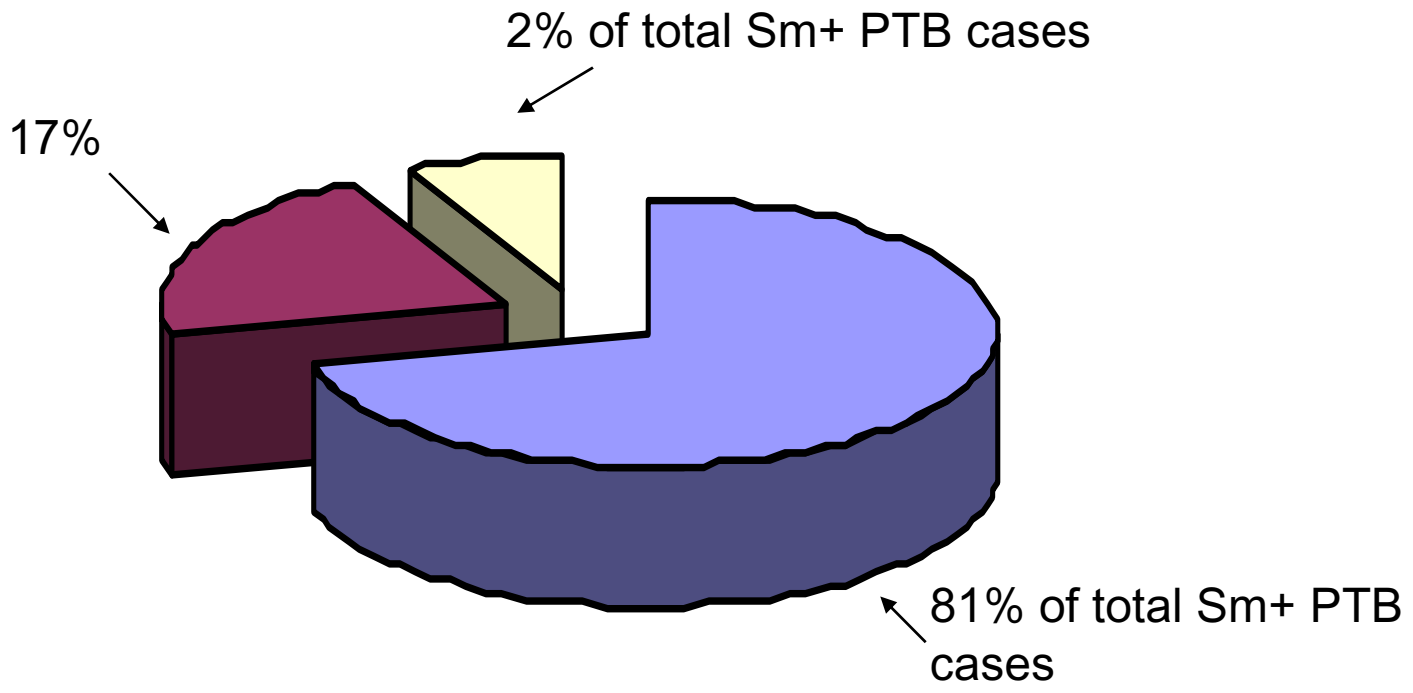
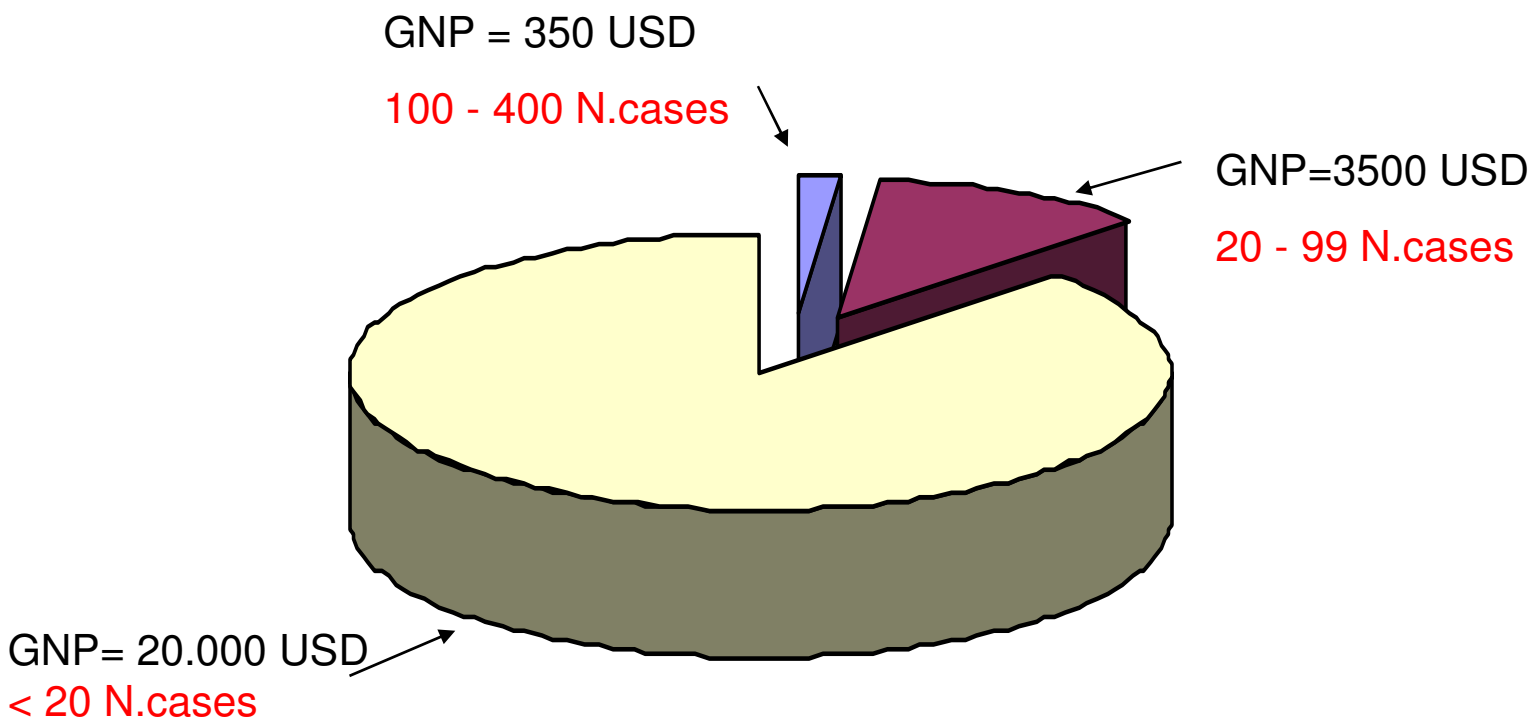
Estimated Smear positive PTB Year 2000/region



Economical ressources (GNP) and Prevalence of new TB cases in 3 types of countries



Reasons of the persistence of the TB in the world

➢ Poverty

- TB is a cause of **damaging economic impact** on patients and their families through spending on diagnosis, treatment, and transport.

- In developing countries, mainly In Sub Saharan Africa, the number of persons living with less than one dollar per day doubled between 1980 and 2000. It represents 46.5% of the population.

- 3 to 4 months are lost from work per each patient leading to a lost of 20 à 30% of the family wages.

Reasons of the persistence of the TB in the world

- **Demographic factor**

- Increasing of the global population : 6 billion in 2000, will be 7,9 in 2025.

- The flow of migration from high prevalence TB settings will increase the TB transmission to the local population

- High risk for these migrants to develop TB living in a difficult conditions (insalubrious household, insufficient nutrition, difficult to access to health facilities

Reasons of the persistence of the TB in the world

- **HIV-AIDS Epidemic**

- The interaction of **TB with HIV infection has a negative effect**.
- TB has become the **leading cause of death among people leaving with AIDS**
- HIV infection is the **most potent risk factor for a latent TB infection to convert to active TB**
- The proportion of TB/HIV co-infected cases reaches 10% at the global level and 30% in Sub Saharan Africa
- WHO forecasts that between 2010 et 2020, 10% of new TB cases and 20% of death will be related to patients living with HIV

Effective Tuberculosis Control

DOTS Strategy: Directly Observed Treatment Short-course

1.Political commitment to increase human and financial resources

2. Access to quality-assured TB sputum microscopy for case detection among persons presenting with symptoms of TB

3.Standardized short-course chemotherapy to all cases of TB under direct observation of treatment

4.Uninterrupted supply of quality-assured drugs

5.Recording and reporting system enabling outcome assessment of every patient and overall programme performance

Achievements in Global TB Control

- **DOTS Strategy** : At least **70%** of smear positive PT will be detected **by 2005** and at least **85%** of those will be cured

in 2005 (WHO global report)

- ✓ At the global level, only **45%** **of total cases** are diagnosed under DOTS programs
- ✓ For the 2002 cohort new smear-positive cases, **73%** are cured under DOTS strategy

Detection rates of Smear positive TB cases

WHO region	Detection rate of sm+cases (%)
AFR	45
EMR	27
SEAR	47
WPR	40
AMR	77
EUR	39
Global	44

(WHO 2004)

How to detect 70% of M+ PTB ?

- Improve the accessibility of health structures
- Use the most simple and the cheapest technique for diagnostic
- Supply the laboratory regularly with reagents and other materials
- Plan a regular training for Lab.technicians
- Implement a regular quality assurance of the laboratory network

How to improve the accessibility of Health centres?

- Implement the microscopy diagnosis in the peripheral polyvalent, public and private H.C
- Organize a smooth transportation for specimens instead transportation of patients
- Make sure that the reception of specimens is possible along of the working day
- Assure that the results are ready and sent to the clinician in the day after their reception

TB-Diagnostic Tools for NTPs

- Microscopy
- **One of the five major components of DOTS**
- **First step in early detection of active TB infection**
- **Simple and cheapness technique**
- **Able to detect 70 to 80% of Contagious TB cases in high TB burden countries**
- Culture
- **More sensitive than microscopy : + 20-30%**
- **Gold standard**
- **Early detection of relapses and failures**
- **Diagnostic of EPT and TB in Children**
- **Identification and DST**

Treatment results for Smear positive TB (cohort 2001)

WHO Region	Cases	Results of treatment (%)				
		Success	died	failures	defaulted	Transferred
AFR	352 788	71	7.2	1.1	10	6.6
SEAR	353 423	84	4.4	2.1	6.7	1.2
WPR	333 127	93	2.3	1.0	2.2	1.2
Global	1 203 235	82.3	4.7	1.5	6.5	3.1

How to improve treatment results?

- **The application of Standardized short-course chemotherapy** to all cases of TB under direct observation of treatment
- **The Anti-TB drugs should be free of charge** to all TB patients
- **The use of Fixed-dose combination** could help drug supply logistic, drug administration, reduce non adherence to treatment and prevent development of Drug Resistance
- **The achievement of an uninterrupted supply of quality-assured drugs** must be obtained all over the country
- The application of **a recording and reporting system** to evaluate outcomes of every patient and overall programme performance

TB Control and Drug Resistance

- Drug resistance and MDR-TB are significantly associated with the proportion of previously treated cases in the community
- The administration of SCC under DOT is the cornerstone of curing new cases, this reduce rapidly the pool of previously treated cases.
- The use of multiple drugs in combined therapy under DOT is necessary to prevent the emergence of DR
- HIV-infected TB patients are no more likely to develop DR than HIV negative TB patients

Global Drug Resistance Surveillance

- Global project on Drug Resistance Surveillance is conducted by WHO and IUATLD since 1994 with the support of the Supra National Reference Laboratory Network.
- Three global reports have been published on worldwide drug resistance
- DR is present in all the participating countries, 22 settings reported MDR-TB

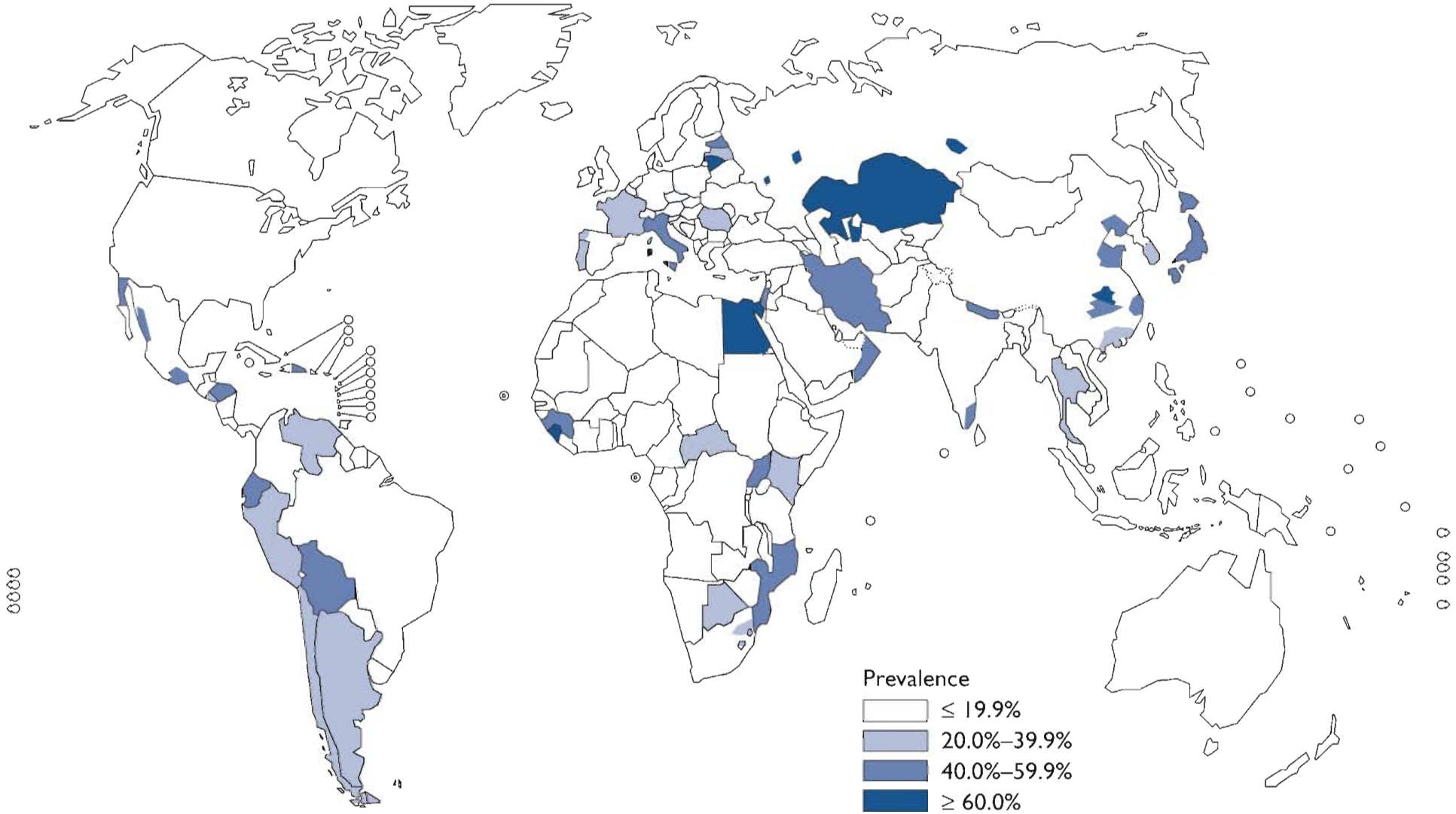
DRUG RESISTANCE AMONG PREVIOUSLY TREATED CASES

- Resistance among previously treated cases is defined as the presence of resistant strains of *M. tuberculosis* in a patient who, in response to direct questioning, admits having been treated for tuberculosis for 1 month or more, or, in countries where adequate documentation is available, in a patient for whom there is evidence of such history.

DRUG RESISTANCE AMONG NEW CASES

- Resistance among new cases is defined as the presence of resistant strains of *M. tuberculosis* in a patient who denies having had any prior anti-TB treatment (for more than 1 month), and, in countries where adequate documentation is available, for whom there is no evidence of such history.

Prevalence of any drug resistance among previously treated TB cases, 1994–2002



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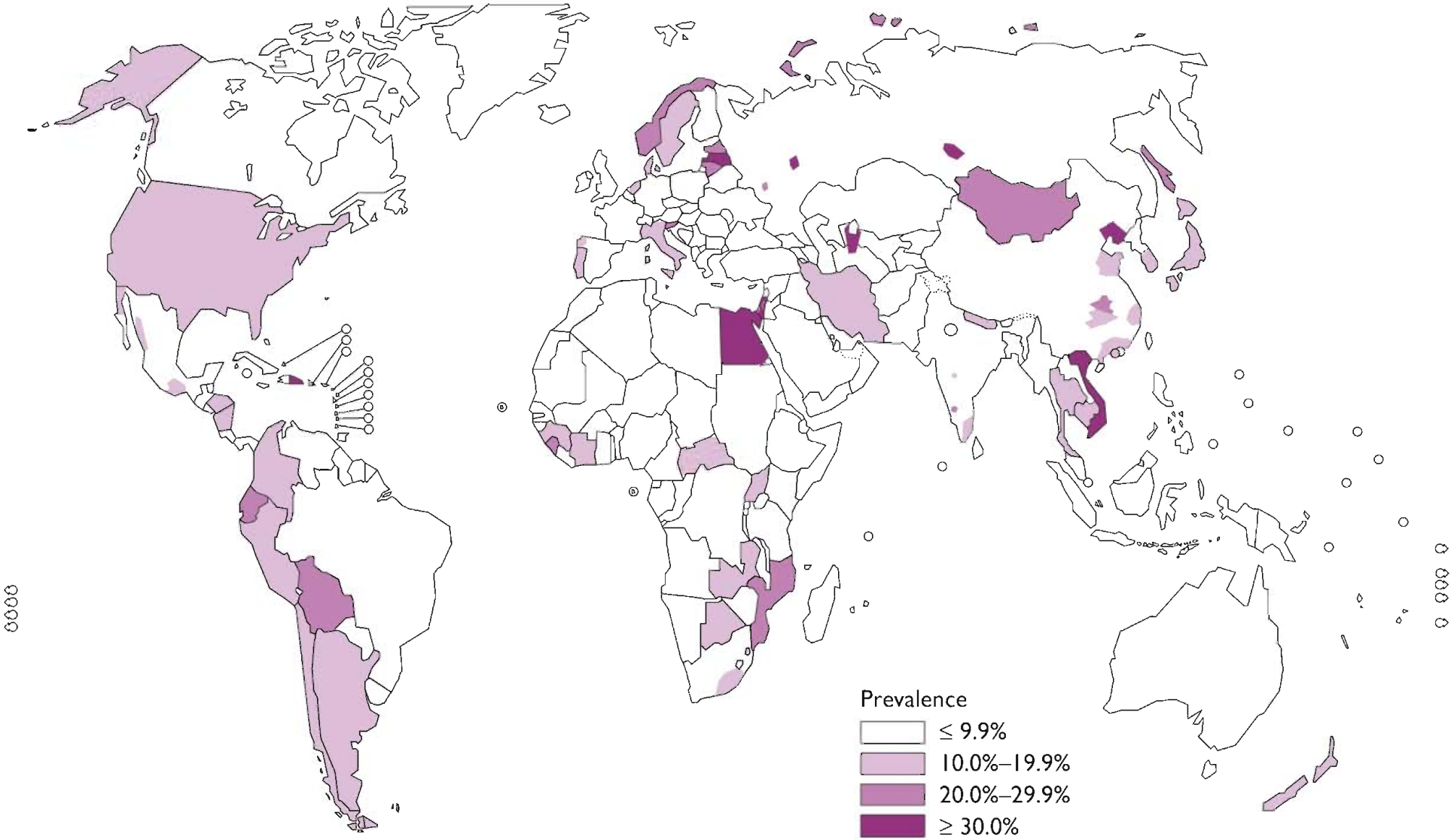
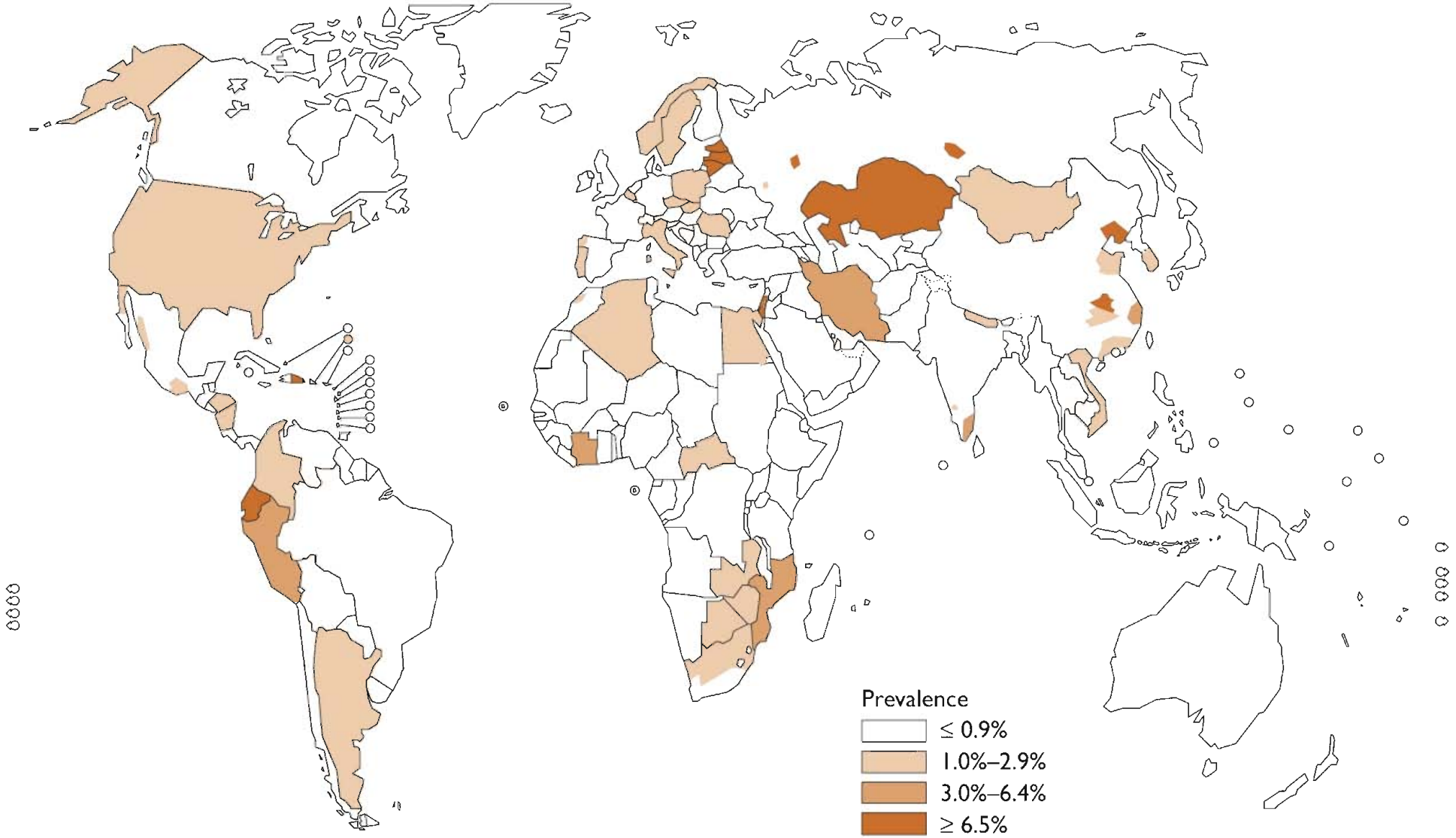


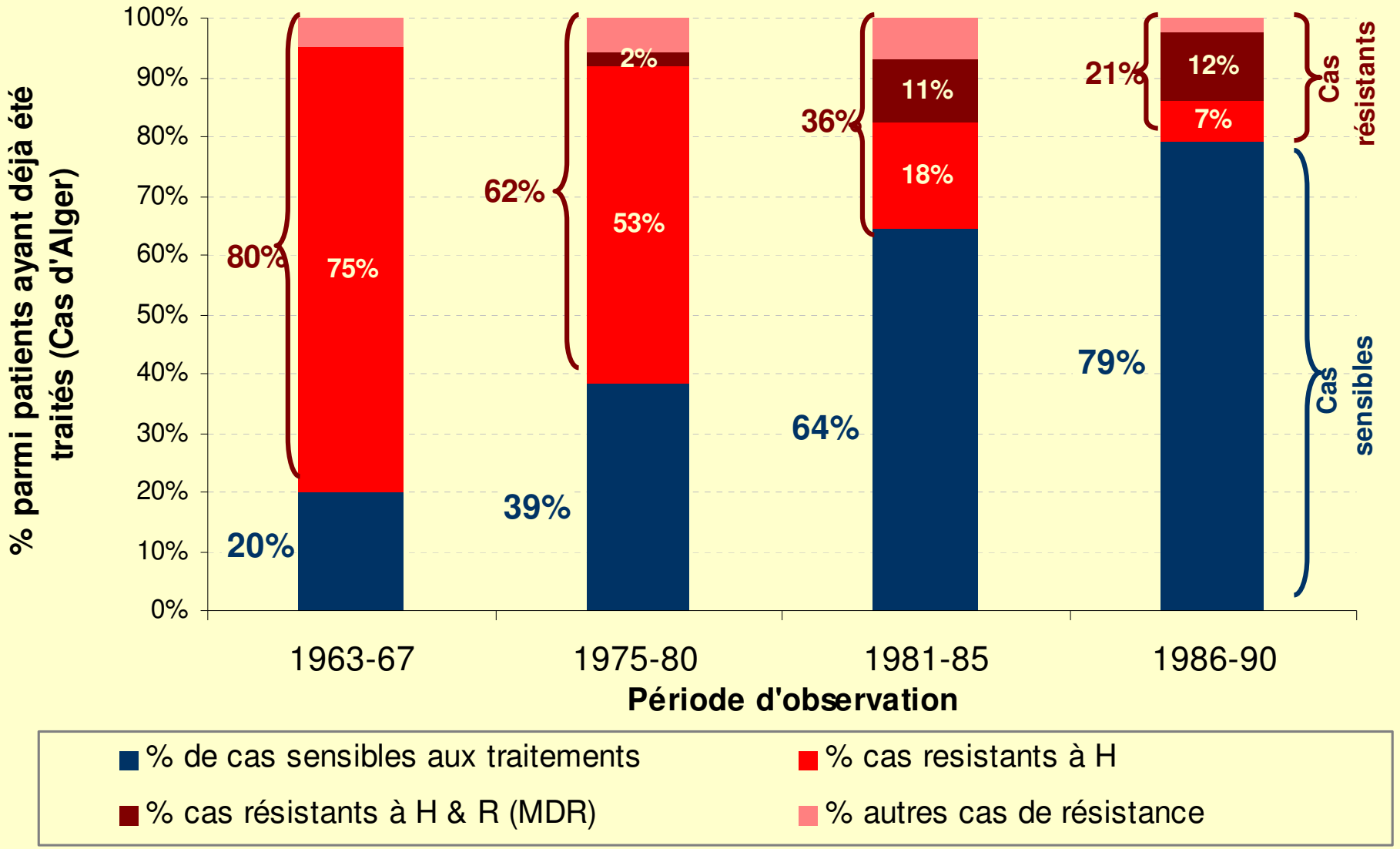
Prevalence of MDR-TB among new TB cases, 1994–2002



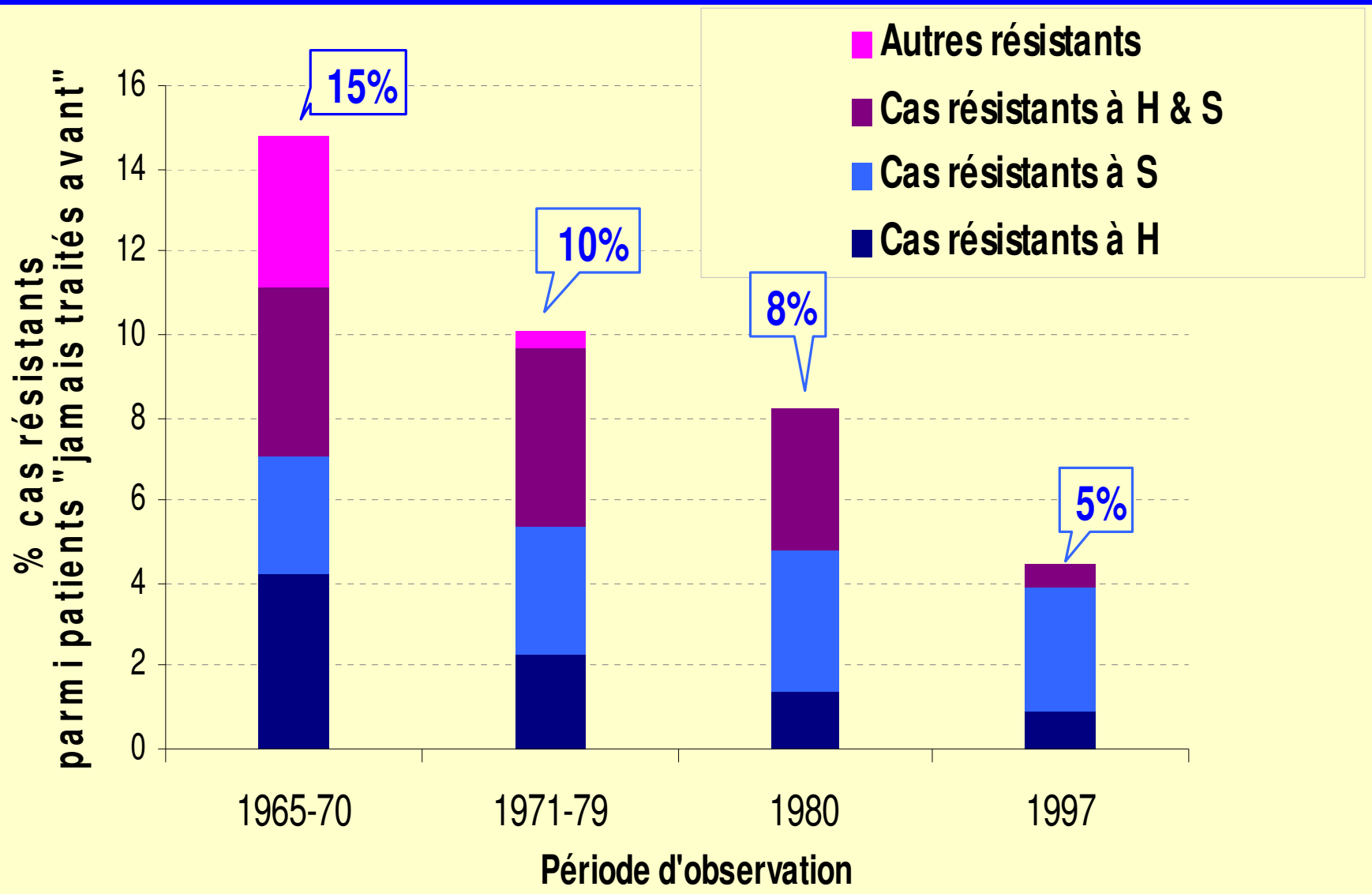
National TB Programme in Algeria

- Government commitment against tuberculosis from 1966 up to now:
  - ✓ Diagnostic and treatment are free of charge for patients
  - ✓ No selling Anti-TB drugs in the market
- 1966-1972: technical guidelines for case finding, diagnosis and treatment of tuberculosis
- 1972-1980: Treatment standardisation all over the country
- 1980-1999: Standardised and DOT SCC (6 months with RH)
- 1999 : Updating the guidelines of NTP according WHO recommendation

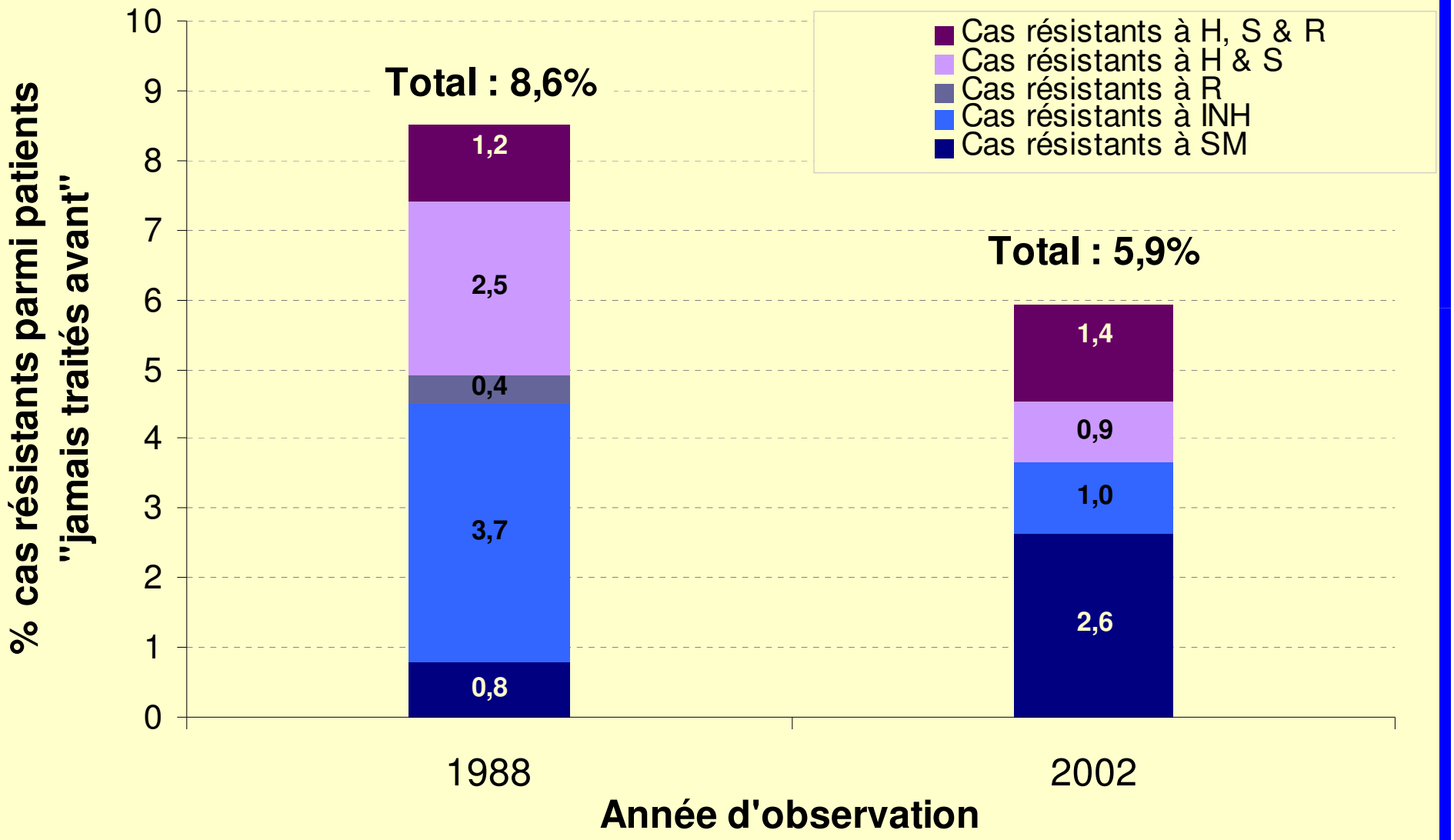
Trends of Drug Resistance among previously treated cases - Algeria 1963-1990



Trends of Drug Resistance among new cases Algeria 1965 -1997



Primary Drug Resistance in Algeria
National Surveys 1988 - 2002



Effective Tuberculosis Control

- This requires Health care services to be **widely available and accessible** to the whole population

- Adequate investments in the health system are essential to provide **access to a sputum microscopy network** with built-in quality control

- As resources increase, additional diagnostic tools such as **culture and drug susceptibility testing may be added**, New tools such as molecular biology for rapid diagnostic and ST are not yet recommended in high burden, resources-limited TB countries

- HIV infection remains the single most important factor that increases the risk of developing TB. **TB control programmes should be linked closely with HIV/AIDS prevention and control programmes**

World TB Day 2006: *"For a TB free World"*

- The **1.8 billion persons** in the world are estimated to harbor latent TB bacilli (LTBI). They **represent an enormous reservoir of potential TB cases**
- The majority of TB cases results from the **reactivation of LTBI**
- **Identification and treatment of persons with LTBI** to prevent the future development of active disease **is an effective tool for TB control**
- But, this intervention is very difficult to apply in areas of the developing world where TB is most endemic and where the **highest priority remains case detection and treatment of active cases**
- **When do we expect to eradicate TB from the world?**
- **Is it possible?**

The future

Fighting TB to eradication seems not to be easy. We need

- The commitment of the governments
- The financial support of international institutions, donors, communities, health personnel,
- Many challenges remains to solve
  - We need new tools for diagnosis and DST: microscopy examination is still the only widely available means of diagnosing TB in developing countries
  - We need new molecules for treatment: greater effort is still required to translate promising basic research into discovery programs
  - We need new vaccines