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WORLD RADIOLOGY DAY 2013

RADIOLOGY: FACING SOME MAJOR PUBLIC HEALTH CHALLENGES IN LAC: CANCER, CVDS, TB, MATERNAL AND INFANT MORTALITY

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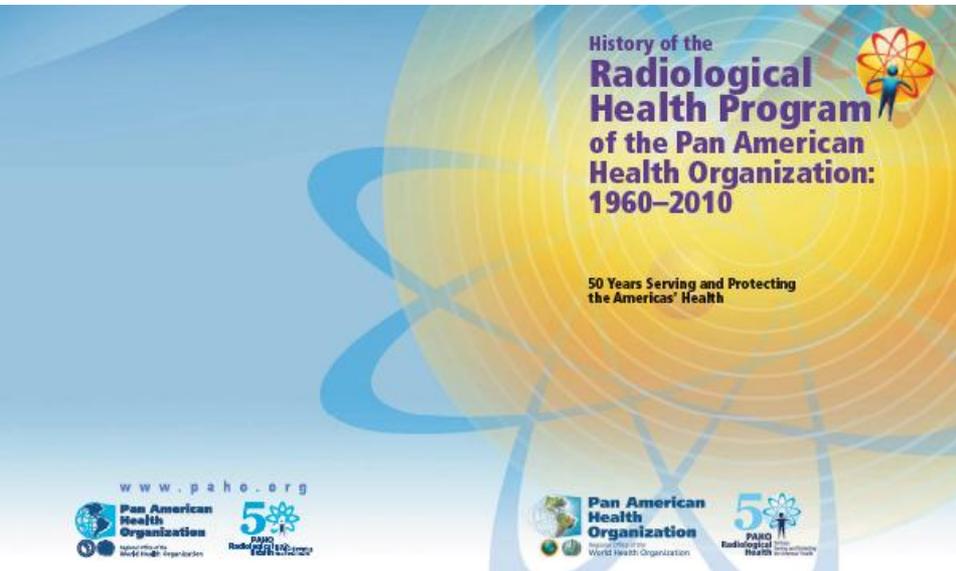
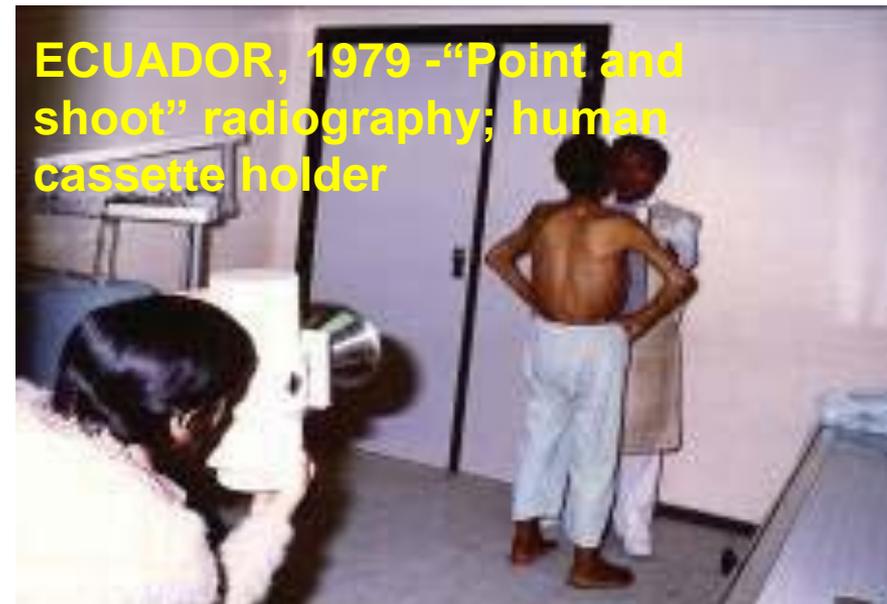


CONTENT

- PAHO's Radiological Health Program
- Role of radiology in addressing:
 - Maternal mortality
 - Bacterial pneumonia
 - Tuberculosis
 - Injury and trauma
 - Cancer and cardiovascular diseases

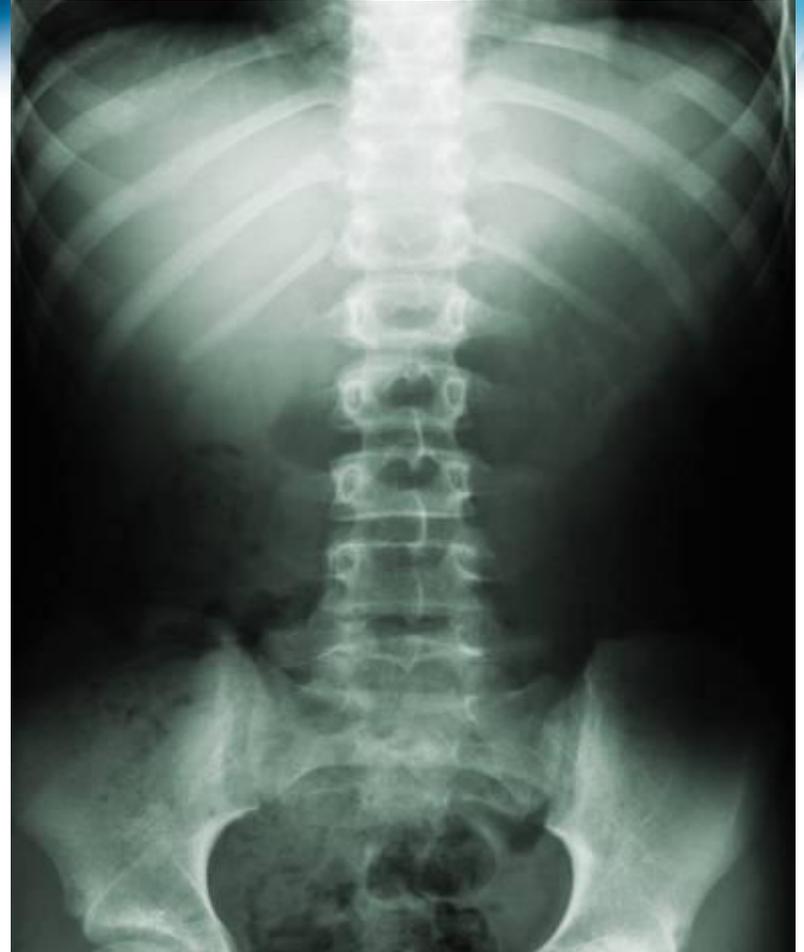
PAHO's Radiological Health Program

- PAHO's Radiological Health Program was established in 1960
- History of the PAHO's Radiological Health Program 1960-2010.



SCOPE

- Diagnostic Imaging services
- Radiation Therapy services
- Health Technology Assessment and Management
- Radiation Safety of the public, patients, workers and environment
- Radiation Emergencies



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INTRODUCTION

- Developing countries are facing
 - The prevalence of communicable diseases
 - A swift rise of non-communicable diseases
- The radiology services encompass a wide spectrum of clinical applications.
- Low and middle income countries have difficulties in obtaining the benefits of the technological developments in radiology.

ACCESS TO RADIOLOGY SERVICES

- Availability of diagnostic imaging varies widely around the Region.
 - The level of use and access to these services is far lower in developing than in the industrialized countries.
- Access within the same country is also inequitable for both geographical and economical reasons
 - Most of these services are located in big cities, so a large part of the rural population has no access to them.
 - Their high cost also makes them inaccessible to poor urban populations.

QUALITY OF RADIOLOGY SERVICES

- Health systems and services
 - Fragmentation of health systems and segmentation of providers impact the continuous health care
- Lack of appropriate referral criteria
- QA Programs implemented almost inexistent
 - Radiation doses are not optimized
- Shortage of qualified human resources:
 - Radiologists, Technologists, Medical Physicists and Clinical Engineers
 - Lack of training/ formal education programs on a national level or poor curricula.
 - Lack or poor mechanisms for recognition or certification of these professionals



MAJOR CHALLENGES

RESOLUTION

CSP28.R15

**RADIATION PROTECTION AND SAFETY OF RADIATION SOURCES:
INTERNATIONAL BASIC SAFETY STANDARDS**

THE 28th PAN AMERICAN SANITARY CONFERENCE,



The 28th Pan American Sanitary Conference endorsed the BSS on 20 September 2012, and requested PAHO to cooperate with its Member States on their implementation



- Improve access and quality of care towards Universal Health Coverage
- Introduce, update and implement appropriate regulations
- Address the shortage of qualified human resources
- Properly incorporate and manage the health technologies
- Address the new and rapidly evolving health technologies

Role of radiology in reducing maternal mortality in Latin America and the Caribbean

Magnitude of the Problem

- Low income countries experience more than 500,000 maternal deaths/year, leading cause for women of childbearing age 15–44 years.
- In Latin America and the Caribbean, there are 6,008 maternal deaths representing a maternal mortality ratio of 62.2 per 100,000 live births



Ultrasound transverse view of twin pregnancy.

Role of Radiology

- Ultrasound technology is excellent to diagnose fetal growth restriction.
- In addition ultrasound diagnostic imaging can address placenta previa, multiple gestations, obstructed labor, congenital anomalies, as well as a number of tropical diseases and pathological conditions commonly found in lower resources countries.



Endovaginal ultrasound performed at 10 weeks gestation.

Role of radiology in epidemiological sentinel surveillance of bacterial pneumonia in Latin America and the Caribbean

Magnitude of the Problem

■ ANNUAL WORLD ESTIMATES:

- Streptococcus pneumonia (Spn) is the biggest public health problem in the world in children and adults, causing a huge spectrum of disease manifestations
- WHO estimates that 1.612,000 deaths are caused by Spn annually in the world
- 716,000 are among children aged less than 5 years
- Most deaths are caused by pneumonia

■ ANNUAL LAC ESTIMATES IN CHILDREN(1990-2006):

- Pneumonia disease burden: 980,000 to 1,500,000
- Meningitis disease burden: 2,600 to 6,800
- Estimates between 12,000 to 28,000 deaths caused by Spn

Source: *WHO.Immunization, vaccines and biologicals global immunization vision and strategy.

<http://www.who.int/immunization/givs/en>

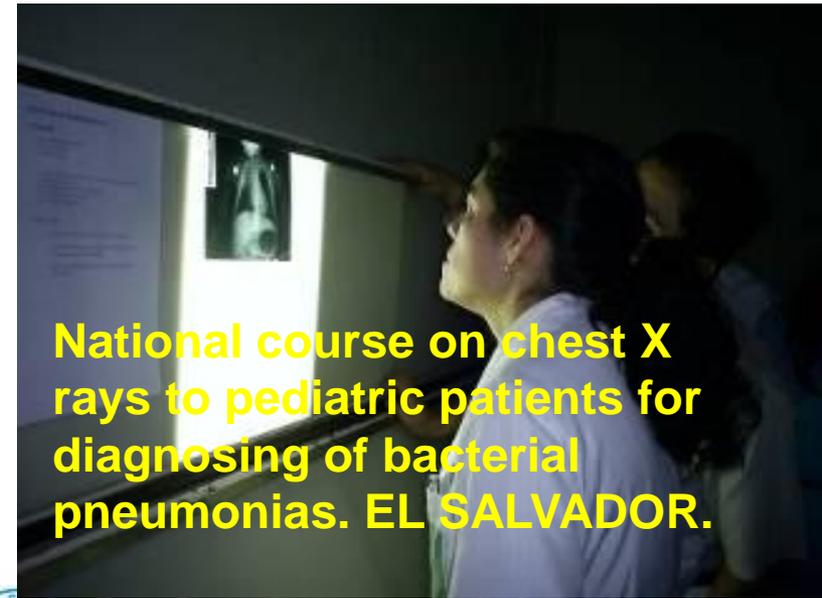
Source: Valenzuela, MT, O'loughlin,,R; De la HOz,F. The burden of pneumococcal disease among Latin American and Caribbean children;review of the evidence. Pan Am J Public Health 25(3),2009.



Role of Radiology

Chest X rays are used for surveillance. Meaning, it is used to classify probable bacterial pneumonia.

- A well-taken and well-interpreted X-ray is crucial for the radiological diagnosis of pneumonia (proper exposure, correct position, accurate interpretation).



Year of universal introduction of the Pneumococcal Conjugate vaccine (PCV), and countries with hospital sentinel surveillance for bacterial pneumonia
Region of the Americas, 2013

Year	23 countries, 7 territories
2000	USA
2002	Canada
2003	<i>Bermuda</i>
2007	Costa Rica
2008	Mexico, Uruguay, <i>French Guyana, Guadeloupe, Martinique</i>
2009	Peru, Barbados, <i>Cayman Islands</i>
2010	<i>Aruba</i> , Brazil, Ecuador, El Salvador, Panama, Nicaragua
2011	Honduras, Guyana, Chile, Colombia, <i>Curacao</i>
2012	Argentina, Bahamas, Guatemala, Paraguay, Trinidad & Tobago
2013	Bolivia, Dominican Republic



1. **Bolivia**
2. **Ecuador**
3. **El Salvador**
4. **Guatemala**
5. **Honduras**
6. **Nicaragua**
7. **Panama**
8. **Peru**
9. **Paraguay**
10. **Venezuela**

Total sentinel sites: 28



Source: FCH/IM

Sentinel hospital surveillance of bacterial pneumonias

Countries that reported

Region of the Americas, 2008-2012

Years	2008*	2009*	2010*	2011*	2012*
# of hospitalizations < 5 years old	77,309	94,603	70,536	135,199	127,334
# of suspected pneumonias cases	8,938	12,111	8,876	19,806	17,553
# suspected pneumonia cases with x-ray and investigation forms	7,599	10,647	7,859	15,929	12,643
% of X-rays done from the suspected cases	85%	88%	89%	80%	72%
# of probable cases of bacterial pneumonia	6,324	8,481	6,638	11,327	9,256
% of probable cases of bacterial pneumonia	83%	80%	84%	71%	73%
# of probable cases with blood sample	5,028	6,702	4,445	7,098	6,702
# of probable cases with liquid pleural	339	250	159	142	133
# of confirmed cases with Hib	5	12	28	15	6
# of confirmed cases with Hi (no b)	9	2	4	15	3
# of confirmed cases with Spn	76	89	71	120	60
# of confirmed cases with other bacteria	454	756	353	502	257
# of contaminations	-	-	-	451	246
# deaths	303	288	125	193	329

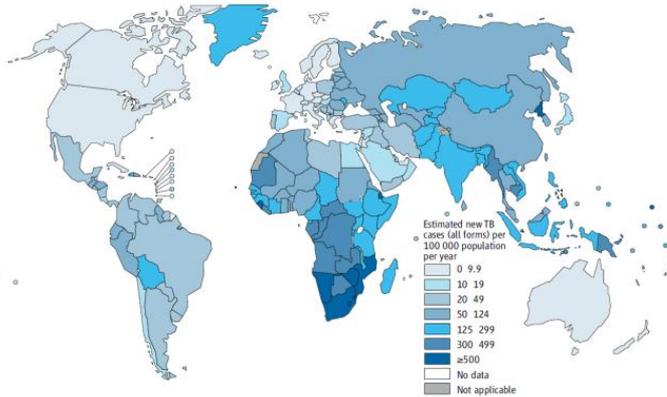
*2008: BOL, ECU, ELS, GUT, HON, NIC, PAR
 *2009: BOL, ECU, ELS, GUT, HON, NIC, PAR, VEN
 *2010: ECU, ELS, GUT, HON, PAR, VEN
 *2011: BOL, ECU, ELS, GUT, HON, NIC, PAR, PER, VEN
 *2012: BOL, ECU, ELS, GUT, HON, NIC, PAN, PAR, PER, VEN



Role of radiology in controlling tuberculosis in Latin America and the Caribbean

Magnitude of the Problem

Estimated TB incidence rates, 2012



In the Region

Estimated number of cases

Estimated number of deaths

All forms of TB

BRA, PER, MEX, HAI → 61% of cases

280,000

(260–300,000)

19,000*

(16–21,000)

HIV-associated TB

31,000

(31 - 38,000)

Multidrug-resistant TB

7,100

**Excluding deaths attributed to HIV/TB*

Source: WHO Global Tuberculosis Report 2013

Role of Radiology

- Chest radiography is a highly sensitive technique for diagnosing pulmonary TB (imuno and immunocompetent patients) but it is unspecific (no pathognomonic signs).
- Chest radiography is a good screening test of pulmonary TB (primary screening test or secondary after symptoms screening).

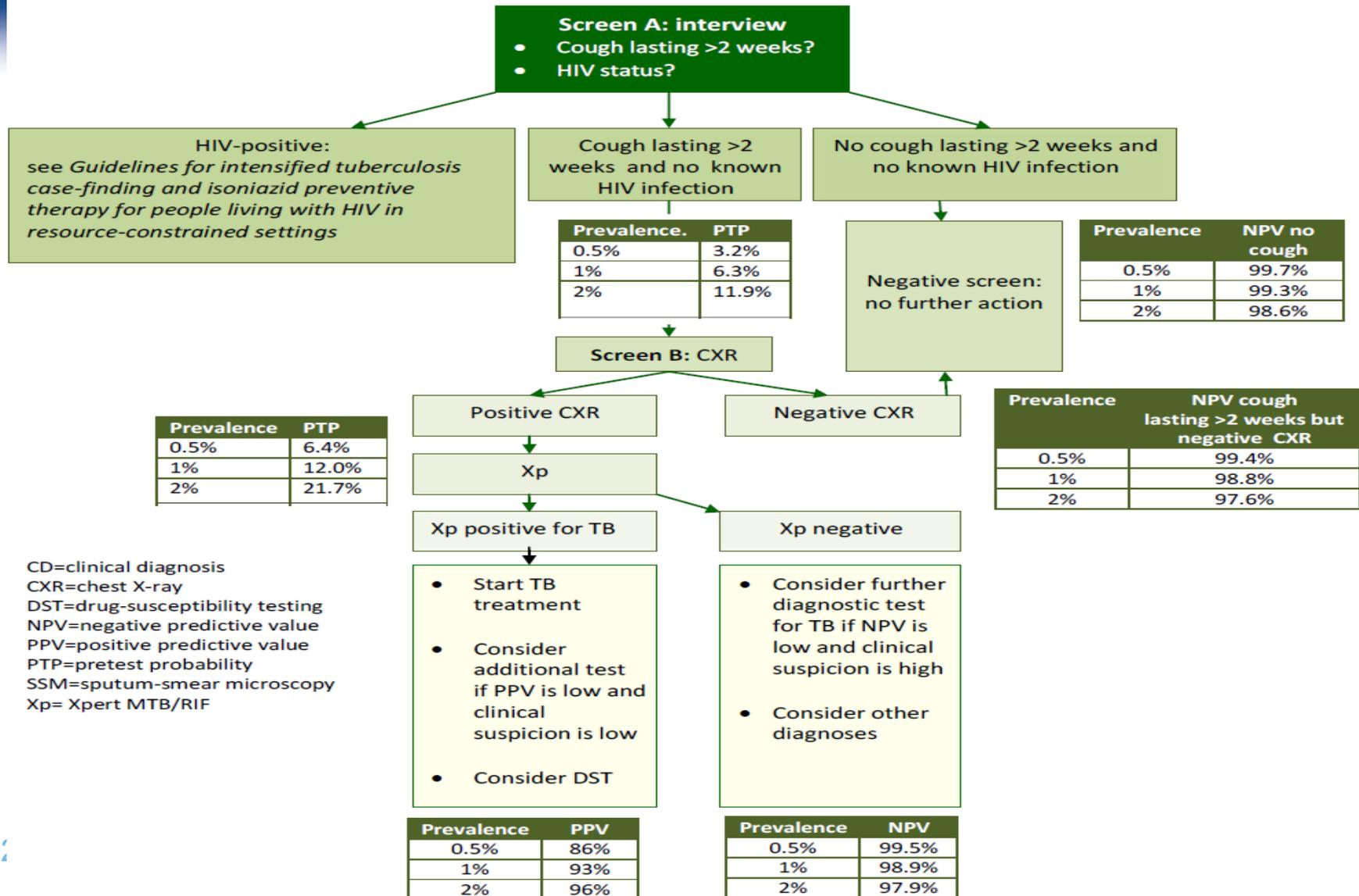
Chest X-ray alone is not sufficient TB diagnostic test



Chest X-ray TB

Role of Radiology

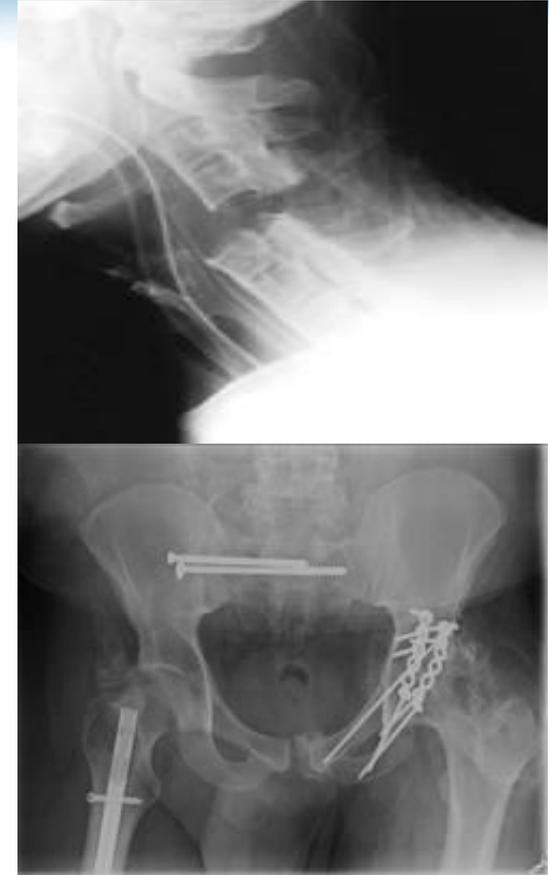
Chest X-ray in the TB Test (Xpert MTB/RIF)



Role of radiology in addressing injuries and trauma

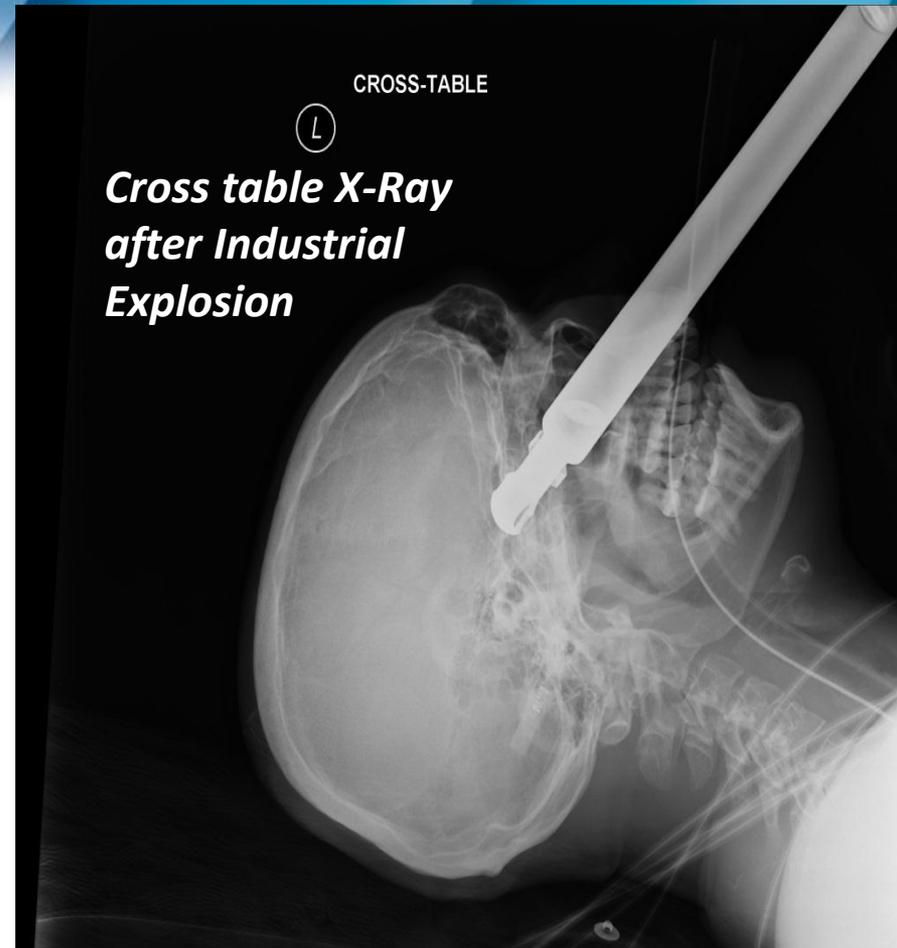
Injury and Trauma

- Injury is the 9th most common cause of premature death worldwide, 90% occurs in LIC, and the 3rd most common cause of years lived with disability.
- Road traffic deaths will increase by more than 80% in developing countries by 2030, which are also particularly vulnerable to injuries due to natural disasters and war.
- There were an estimated 149,992 road traffic deaths in the Americas in 2010.



Role of Radiology

- Emergency care including imaging techniques are necessary for addressing urgent health issues and preventing long-term disability.
- Standard radiology remains the major diagnostic tool for trauma and some types of injuries which are particularly frequent in rural areas.



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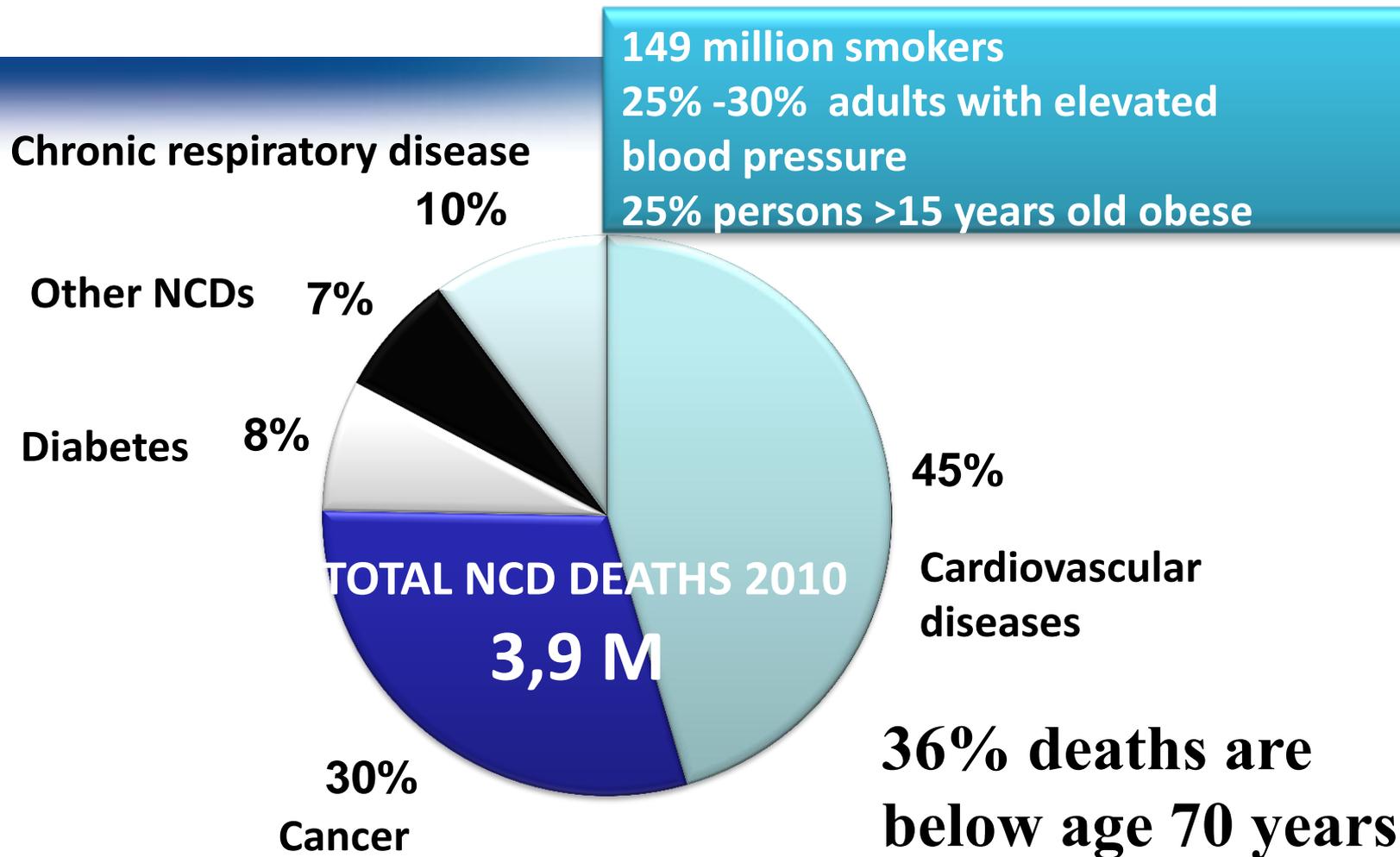
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Role of radiology in controlling cancer and cardiovascular diseases in Latin America and the Caribbean

Non-communicable diseases

- ✓ Non-communicable diseases are the leading cause of premature mortality and disability in the world.
- ✓ Cardiovascular disease, cancer, diabetes, and chronic respiratory diseases combined are responsible for 60% of all deaths and 44% of premature deaths.
- ✓ NCDs accounts for two-thirds of all deaths in Latin America and the Caribbean with an estimated 3.9 million deaths, and 200 million people living with NCDs in the Americas.

FACING THE FACTS IN THE AMERICAS: **disease burden**



Approx. 200 million people living with an NCD in the Americas



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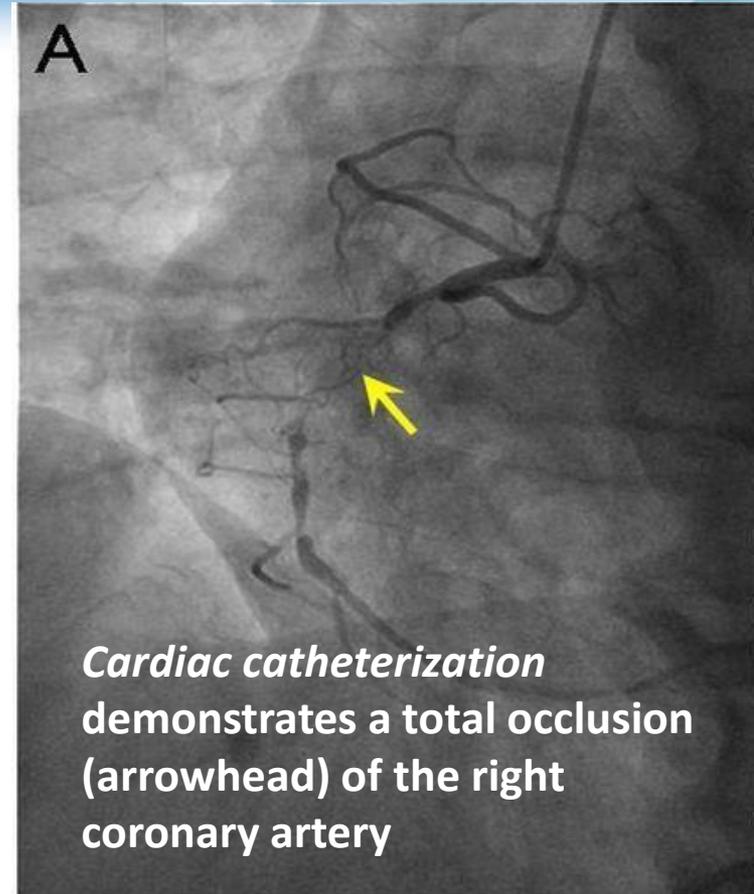
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Cardiovascular diseases

- ✓ In 2008, about 17.3 million people died from cardiovascular diseases (CVDs), over 80% of CVD deaths take place in low- and middle-income countries.
- ✓ By 2030 almost 23.6 million people will die from CVDs.
- ✓ There is sufficient evidence of the effective prevention and treatment of cardiovascular disease.

Role of Radiology

- The diagnosis is possible thanks to radiology. Cardiac ultrasound has diagnostic applications suited to the developing world because of its non-invasive nature.
- Some of the treatments of CVDs are based on image-guided radiology procedures which permits patients to be treated as outpatients.
- However, the stents and coronary bypass are available in less than 50% of countries of the Region (*)



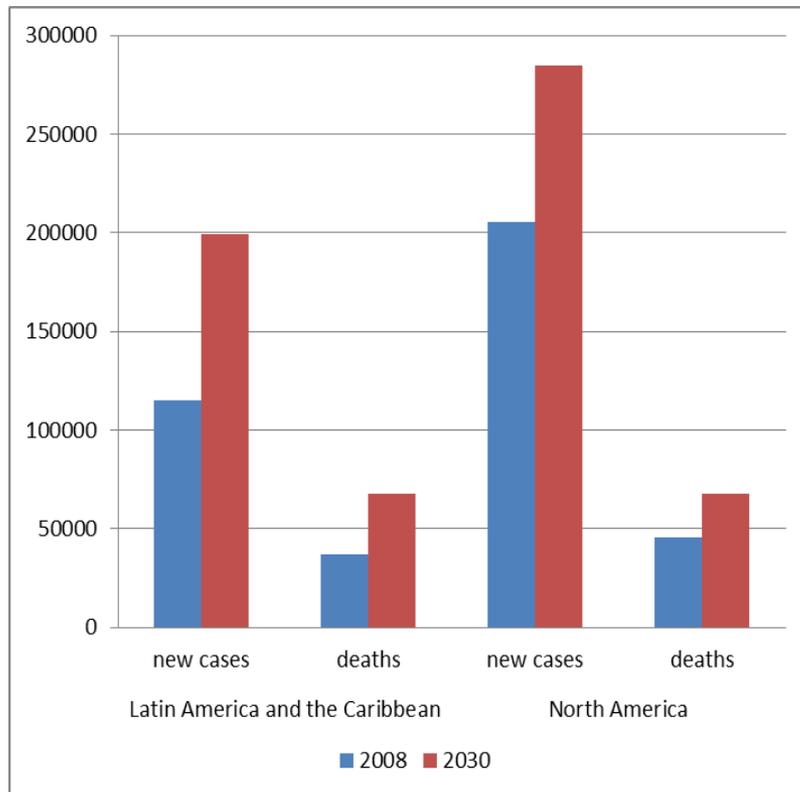
(*) Source: 2013 country profile of capacity and response to NCDs.

Cancer

- Lack of comprehensive cancer control programs represents the major obstacle for reducing cancer mortality in developing countries
- In 2008 about 12.7 million new cancer cases occurred in the world, of which 7.1 million in low- and middle-income countries with 4.8 million deaths.
- It will increase by 2030 to 21.4 million new cancer cases and 13.2 million cancer deaths.

Breast Cancer

- ✓ While each year over 82,500 women die from breast cancer in the Americas as a whole, 46% of all breast cancer deaths occur in LAC.



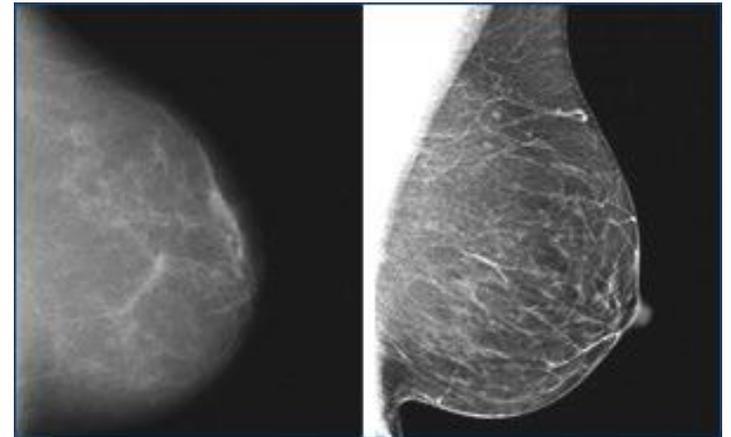
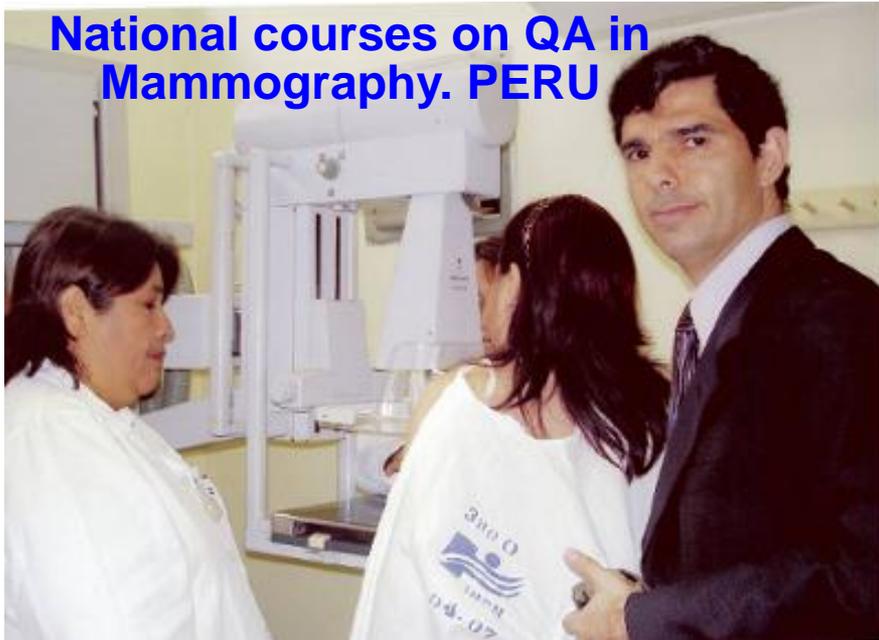
- ✓ Breast cancer is the most common malignant tumor in women
- ✓ By 2030, the number of women newly diagnosed with breast cancer is projected to increase 60%, if current trends continue

Role of Radiology

- Early detection, accurate diagnosis and appropriate treatment are the primary methods of breast cancer control
- Data regarding coverage by mammography from population based studies in the countries are scarce. Available data show low coverage rates (from 10,8 Ecuador to 74,1 Brazil)

Source: PAHO: Non communicable Diseases in the Americas; Basic Indicators 2011, Washington DC, United States of America, 2011

National courses on QA in Mammography. PERU



MANY THANKS



Contact Information

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