

**NEONATAL SCREENING MODELS OUTSIDE THE U.S.:
PROTOCOLS AND TECHNOLOGY UPDATES
A Model in Mexico**

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Pedro Berruecos, M.D.

General Hospital of México

National University of México

MEXICO

General Data

- **Area:** 1,958,201 kms₂
- **Coasts:** 11,952 kms
- **Entities:** 31 States and DF
- **Limits:** N; USA
S: Guatemala & Belice
E: Gulf of México
W: Pacific Ocean
- **Total population:** 97,483,412
- (104 million in 2003)
11th most populated country in the world

Annual Population Growth

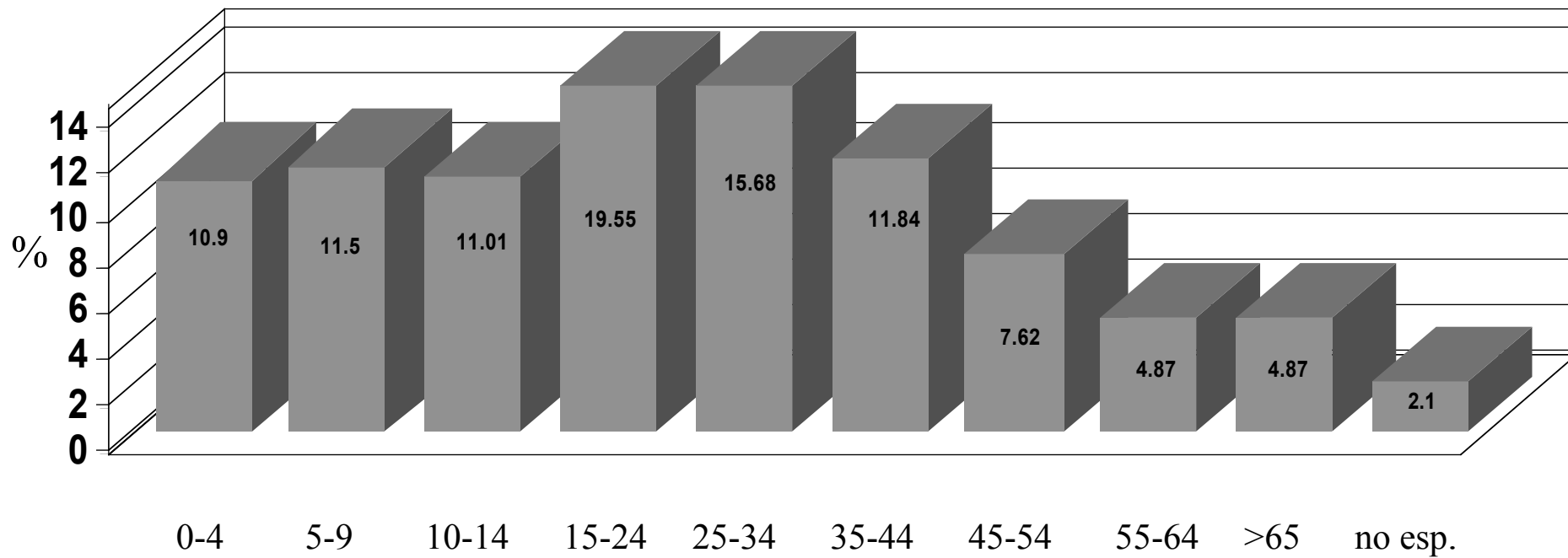
1990-2000: 1.90 %

1990-1995: 2.10 %

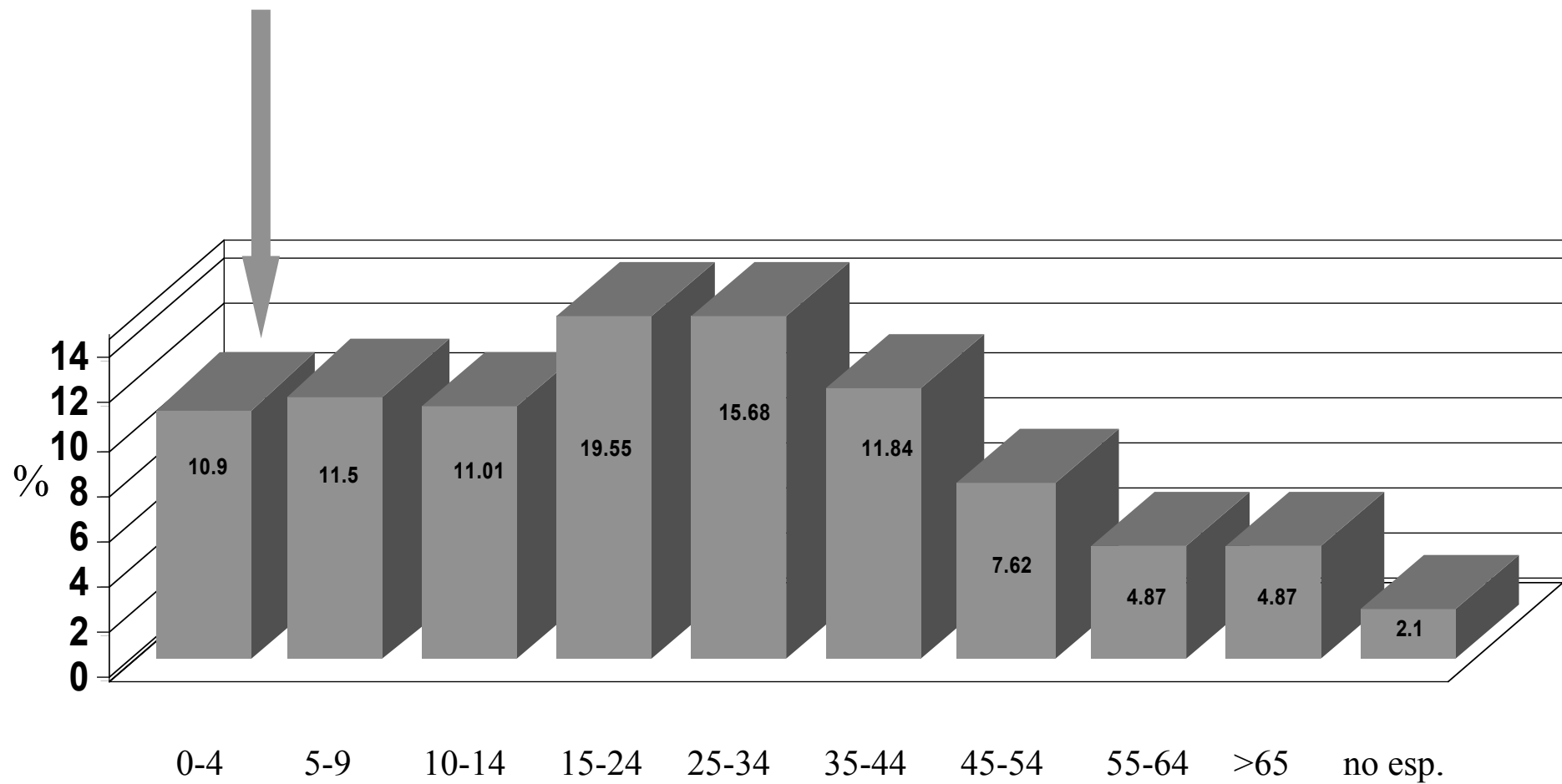
1996-2000: 1.58 %



AGE GROUPS (%)



AGE GROUPS (%)



ECONOMY

Gross Domestic Product (2001):

618,031.4 Mill USDlls

PCAI: 1994: 4,010 US Dlls

2001: 6,338 US Dlls



Inflation annual rate:

1999

9.6%

2000

8.9%

2001

4.4%

2003

3.8%



HEALTH

Health System Coverage

Social Security:

Ministry of Health ('open' population):

Other (ISSSTE, CFE, PEMEX, SDN etc.):

Private services:



1/3 without social security

Lack of a unified health system

Lack of reference and contrareference system

OFFICIAL ACTIONS

MINISTRY OF HEALTH PRESS RELEASE (February 7, 2002):

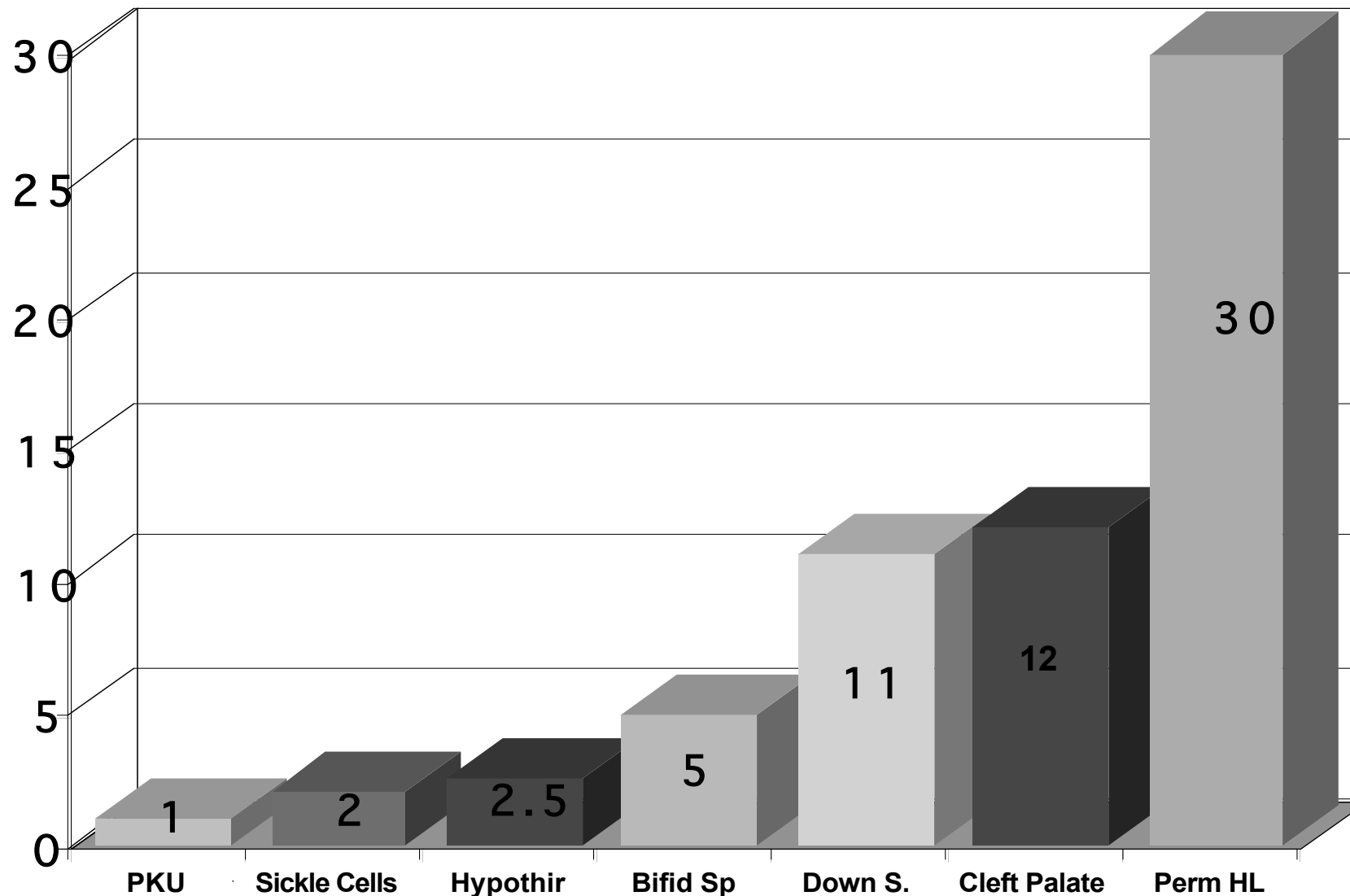
**NATIONAL COMMISSION FOR THE PREVENTION
AND REHABILITATION OF DISABILITIES**

**PROGRAM “ARRANQUE PAREJO EN LA VIDA”
(EQUALITY TO START LIFE)**

HL is not considered

PREVALENCE OF VARIOUS “SCREENABLE” DISEASES AMONG NEWBORNS

(per 10,000 neonates)



Johnson, J.L., Mauk, G.W., Takekawa, K.M., Simon, P.R., Sia, C.C.J., & Blackwell, P.M. (1993). Implementing a statewide system of services for infants and toddlers with hearing disabilities. *Seminars in Hearing*, 14(1), 105-119.

GHM PROGRAMS

Parent's education and guidance

Genetics and Deafness

Newborn hearing screening

Screening in school-age children ("Eargames" program)

Psychopedagogical and Psychosocial programs, linked with
(re) habilitation procedures

Week of Hearing Health: a model for prevention

Donations of HA program

Cochlear Implant program

Assessment and Intervention in Auditory Disorders in the Elderly

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ASSESSMENT OUTCOMES

(Sept. 2003 – April 2004)

EVALUATION OF NORMAL(N) AND HIGH RISK (HR) NEWBORNS

Total of newborns in the 8-month period	5,506 (100 %)
N evaluated	1,320 (23.9%)
Total of HR in the 8-month period	284 (100%)
HR Evaluated	226 (79.5%)

TOTAL OF NEWBORNS EVALUATED 1,546

N (1,320): 1,301 normal and 19 abnormal OAEs
HR (226): 208 normal and 18 abnormal ABR/ASSR

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HEARING DISORDERS IN MEXICO

(Screening of HI in Neonates Program; HGM, 2004)

Basic Data	Status	Mexico and Int'l Indexes
Normal Neonates Studied : 1,320	19 cases (1.44%): abn. initial EOAs With ABR/ASSR: 5 unilateral and 4 with moderate bilateral loss	3.03 / 1000
NICU Neonates studied: 226	26 cases (11.5%) with abnormal initial EOAs With ABR/ASSR: 20 normal and 6 with bilateral loss (3 mild, 1 severe and 2 profound)	Index : 1/ 37 Contrast with the 1/50 index 3/1546: 1.94/1000
<p>1/1000 Newborns: Congenital Deafness → 2,080 new deaf/year</p> <p>5.7% of newborns need NICU → 1,560,000 newborns/year → 88,900</p> <p>1/37 NICU babies are deaf in Mexico → 2,400</p> <p>NEED TO TEST 88,900 NEWBORNS TO FIND 2,400 NEWBORN DEAF</p> <p>88900 / 33 States : 2780 / year / State → 50 / week / State</p>		

OBSTACLES

SOCIAL

More than the half of the population is living in villages or small cities

An important % of babies born outside a hospital

An important % of babies are discharged immediately after they born

FINANCIAL

Better PCAI but still lack of economic/financial support

HEALTH STRUCTURES

Lack of a national screening program of auditory disorders

Unreliable Handicapped Person's National Register

Unrelated institutions in the national health system and lack of a reference / contrareference program among the actual structures

Inadequacy of distribution of medical and non-medical personnel

EDUCATION

Ignorance (lay public, authorities and professionals – GPs, ENTs, Pediatricians, etc.-) about the real dimension of the problem

GHM PROGRAM

IN SPITE OF OUR EFFORTS:

THE BETTER POSSIBLE PLANNING

FULL INVOLVEMENT OF MDs and RESIDENTS

SPECIAL CAMPAIGN DIRECTED TO MOTHERS (Milk, Diapers, Blankets)

OUR RESULTS ARE LIMITED:

ONLY _ OF THE TOTAL OF NEWBORNS WERE ASSESSED

80% OF HIGH RISK NEWBORNS WERE FULLY TESTED

AN IMPORTANT % OF BABIES ARE DISCHARGED SOME HOURS

BEFORE THE DELIVERY OR DURING THE WEEK-ENDS

SPECIFIC NEEDS IN OUR HOSPITAL:

A SECOND SCREENING EQUIPMENT IN THE NEONATOLOGY UNIT

FULL TIME ENGAGEMENT OF HUMAN RESOURCES FULL

FINANCING AND EDUCATION

FEASIBLE PROPOSALS FOR MEXICO

PREVENTION in all the structures and levels
Involvement of Education and Health Systems

EDUCATION in all structures and levels
Lay People: Information to Parents; Week of Hearing Health
Professionals: Up-to date courses for Medical Students,
GPs & Specialists Authorities: Info about model results

GOVERNMENT

Reference and contrareference programs
Real National Register of HH Persons: demographic, family,
educational, health and socioeconomic data
Increment of investment in screening based in
Prevalence of screenable diseases among the newborns
Cost/Benefit studies

MANDATORY HIGH RISK NEWBORN SCREENING BEFORE DISCHARGE

HIGH RISK NEWBORN SCREENING PROGRAM NEEDS

MODEL

GHM Program adapted and refined

HUMAN RESOURCES

GHM program and model

HEALTH SYSTEM

Reference-contrareference system (decision makers)

EQUIPMENTS

10 OAE equipments / State - 320 - 2.3 US million

3 ABR equipments / State - 96 - 3.4 US million

Mexico's oil production: 3 million barrels/day

3 million x 30 USD/ls = 90 million USD daily = **1 _ hour of oil production !!!**