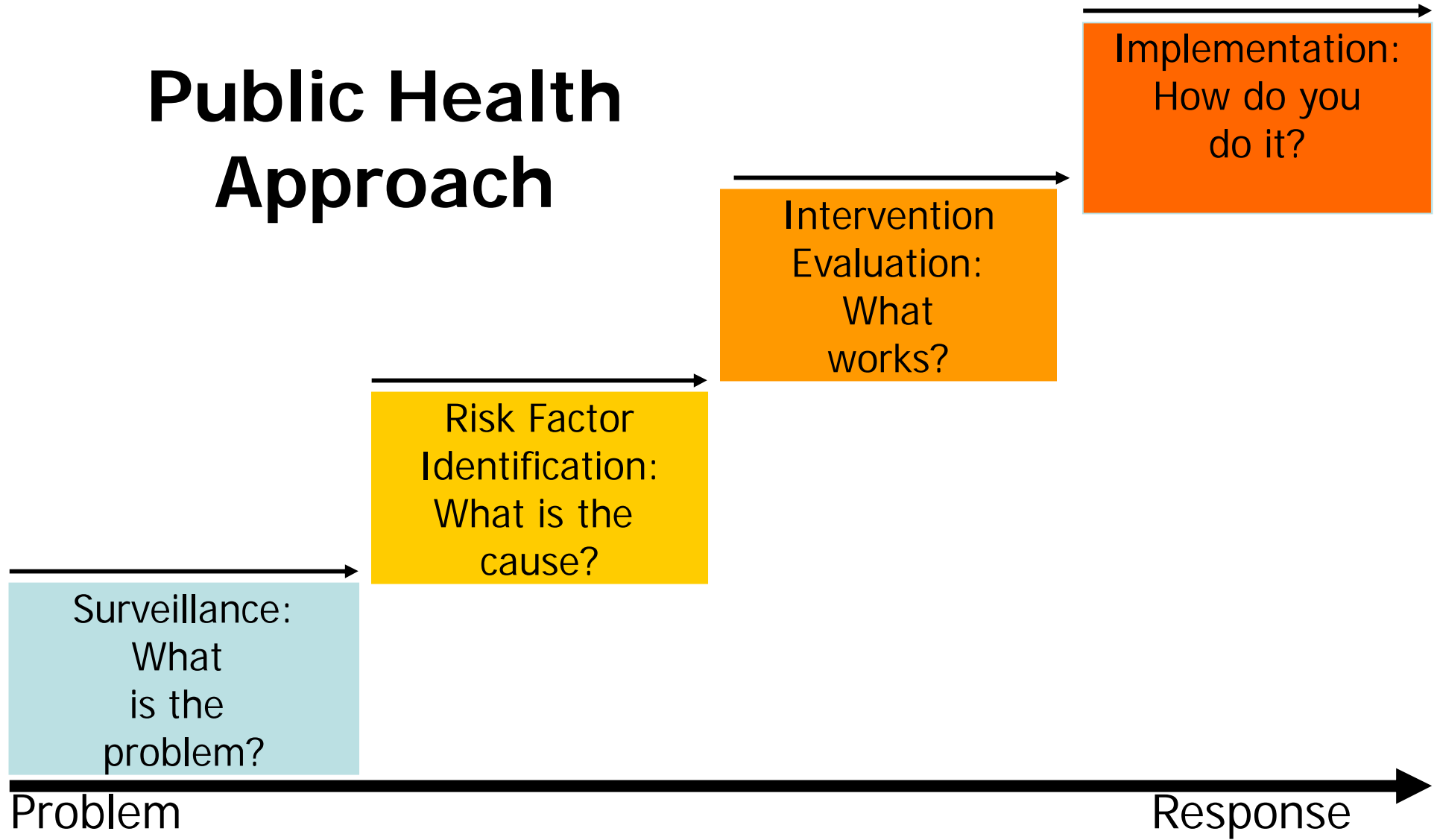


# **Challenges and Opportunities for CVD Control in Africa**

1. Information systems
2. Public health interventions
3. Social-structural determinants
4. Health care

# Public Health Approach



# Public Health Surveillance

- **Ongoing, systematic collection, analysis, and interpretation of health-related data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those responsible for prevention and control.**

# Public Health Surveillance

## Systematic, ongoing

- **Collection**
- **Analysis**
- **Interpretation**
- **Dissemination**
- **Link to public health practice**

# Purposes of Public Health Surveillance

- **Assess public health status**
- **Define public health priorities**
- **Evaluate programs**
- **Stimulate research**

# Core Public Health Functions

- **Assessment**
- **Policy development**
- **Assurance**

**Surveillance**

**Information for Action**

# Uses of Public Health Surveillance

- Estimate magnitude of the problem
- Determine geographic distribution of illness
- Portray the natural history of a disease
- Detect epidemics/define a problem
- Generate hypotheses, stimulate research
- Evaluate control measures
- Monitor changes in infectious agents
- Detect changes in health practices
- Facilitate planning



# Causal Pathway of Disease or Disability

- Environment (pre-exposure)
- Hazard/agent
- Behavior/risk factor
- Exposure
- Pre-symptomatic phase
- Apparent disease
- Death

# **Selected Sources of Data**

- **Environmental monitoring systems**
- **Animals/vectors**
- **Individuals**
- **Laboratories**
- **Medical records**
- **Administrative records**
- **Police records**
- **Birth/death certificates**

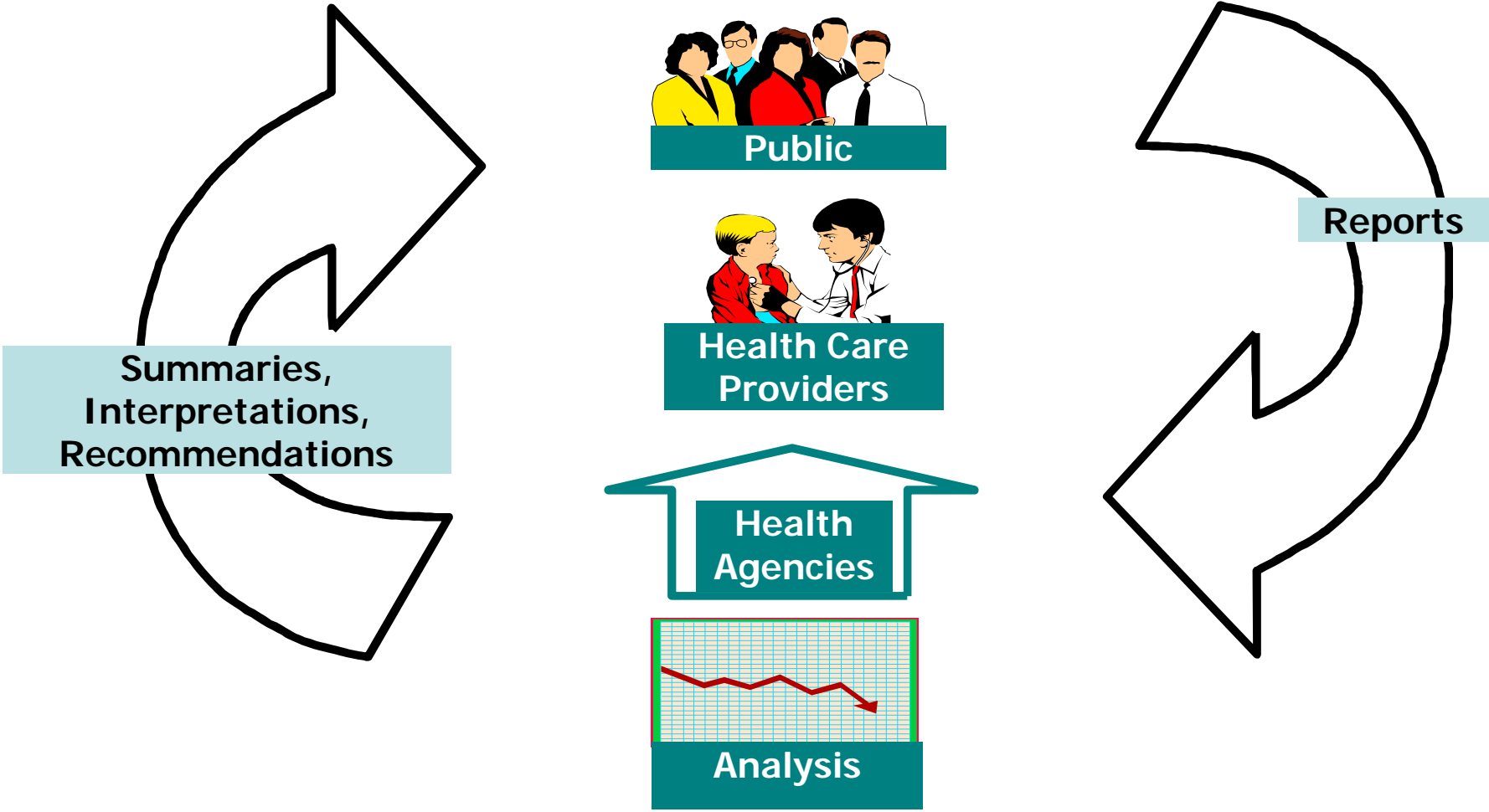
# Data Sources and Methods for Surveillance

- **Notifiable diseases**
- **Laboratory specimens**
- **Vital records**
- **Sentinel surveillance**
- **Registries**
- **Surveys**
- **Administrative data systems**
- **Other data sources**

# Passive vs. Active Surveillance

- **Passive**
  - **Provider-initiated**
- **Active**
  - **Health Department-initiated**

# Information Loop of Public Health Surveillance



## **The Reality of NCD Surveillance in Africa**

No universal registration of births and deaths.

Population estimates uncertain/absent,  
at regional and national levels.

Most persons who die receive little or no medical  
attention.

Weak/absent systems to aggregate statistical data,  
or analyze it.

# Opportunities for NCD Surveillance in the African Context

- Vital statistics: not practical in the foreseeable future.
- Sample communities, verbal autopsies: practical, but expensive and of +/- validity.
- Hospital and other clinical series: cheap, but of virtually no public health value.
- Cross-sectional surveys: necessary to monitor risk factor burden, but insufficient as a guide to attributable risk.
- Imputation (eg, Global Burden of Disease): very low (?absent) validity, could be grossly misleading, ignores geographic heterogeneity

## **Two contrasting approaches can be used to assess the burden of disease:**

Traditional - a combination of surveillance strategies which provide independent measures for the major disease syndromes.

“Unitary summary” - a common metric that provides comparisons across conditions.

-The traditional measures consist primarily of vital statistics, population surveys and health services records.

-The unitary system converts condition-specific measures to a common scale, based on the extent to which the disease state reduces healthy years of life (eg, “disability adjusted life years”, or DALY’s)



## “INDEPTH”

- an international network currently consisting of 31 demographic surveillance system (DSS) field sites in 17 countries that collectively monitor 1,800,000 people at a household-level. The sites are currently located in [Africa](#) and [Asia](#) with the majority of sites located in sub-Saharan Africa. Each site operates in geographically defined populations, and conducts continuous, longitudinal, demographic monitoring, with timely production of data on all births, deaths, causes of death, and migration. This monitoring system provides a platform for the design and evaluation of a wide range of health care innovations as well as social, economic, behavioral and health interventions and research studies.



## INDEPTH Study Procedures:

- **What is a DSS?**
- A demographic surveillance system (DSS) is a set of field and computing operations to handle the longitudinal follow-up of well-defined entities or primary subjects (individuals, households, and residential units) and all related demographic and health outcomes within a clearly circumscribed geographic area. Unlike a **cohort study**, a DSS follows up the entire population of such a geographic area.
- 
- **→ What is a DSA?**
- The demographic surveillance area (DSA) is an area with clearly and fairly permanent delineated boundaries, preferably recognizable on the ground (for example, rivers, roads, and clearly demarcated administrative boundaries). The clear delineation of boundaries enables an unambiguous distinction to be made between individuals, households, and residential units to include in the DSS and those to exclude.

## **What Way Forward for NCD Surveillance in Africa?**

Are WHO data – like “Global Burden of Disease” sufficient?

Should we hold out for vital statistics?

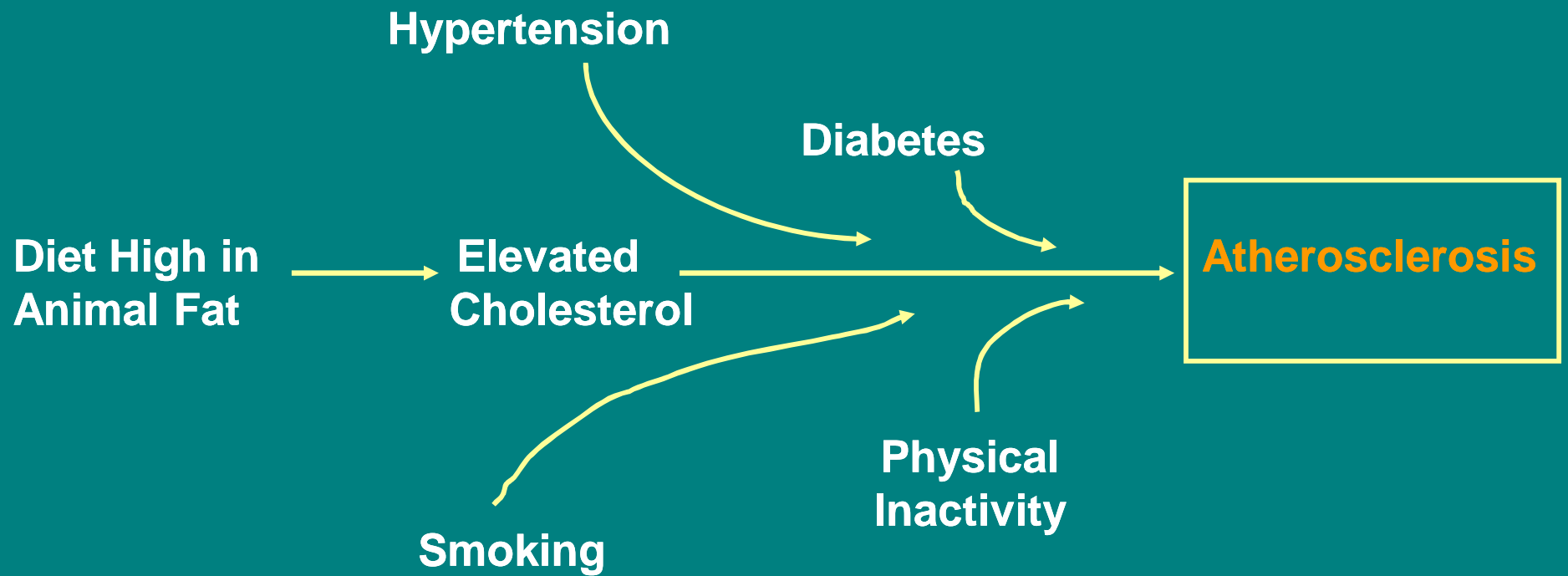
Should further community cohorts be developed?

Would disease-specific estimates be enough for now? (Eg, HIV sero-prevalence, counts of stroke deaths)

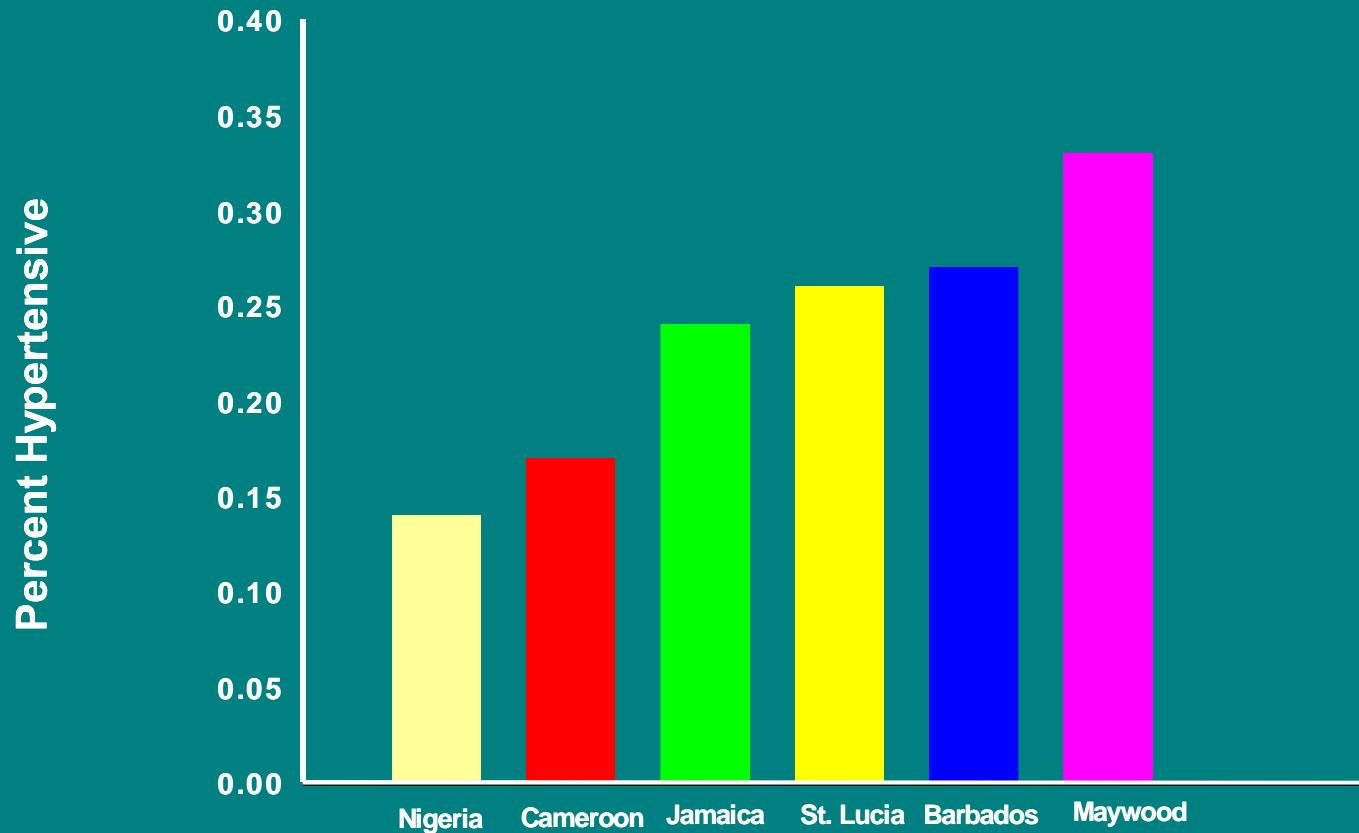
Does it really matter? Do we know enough to act without detailed surveillance data?



# Causal Process in Atherosclerosis

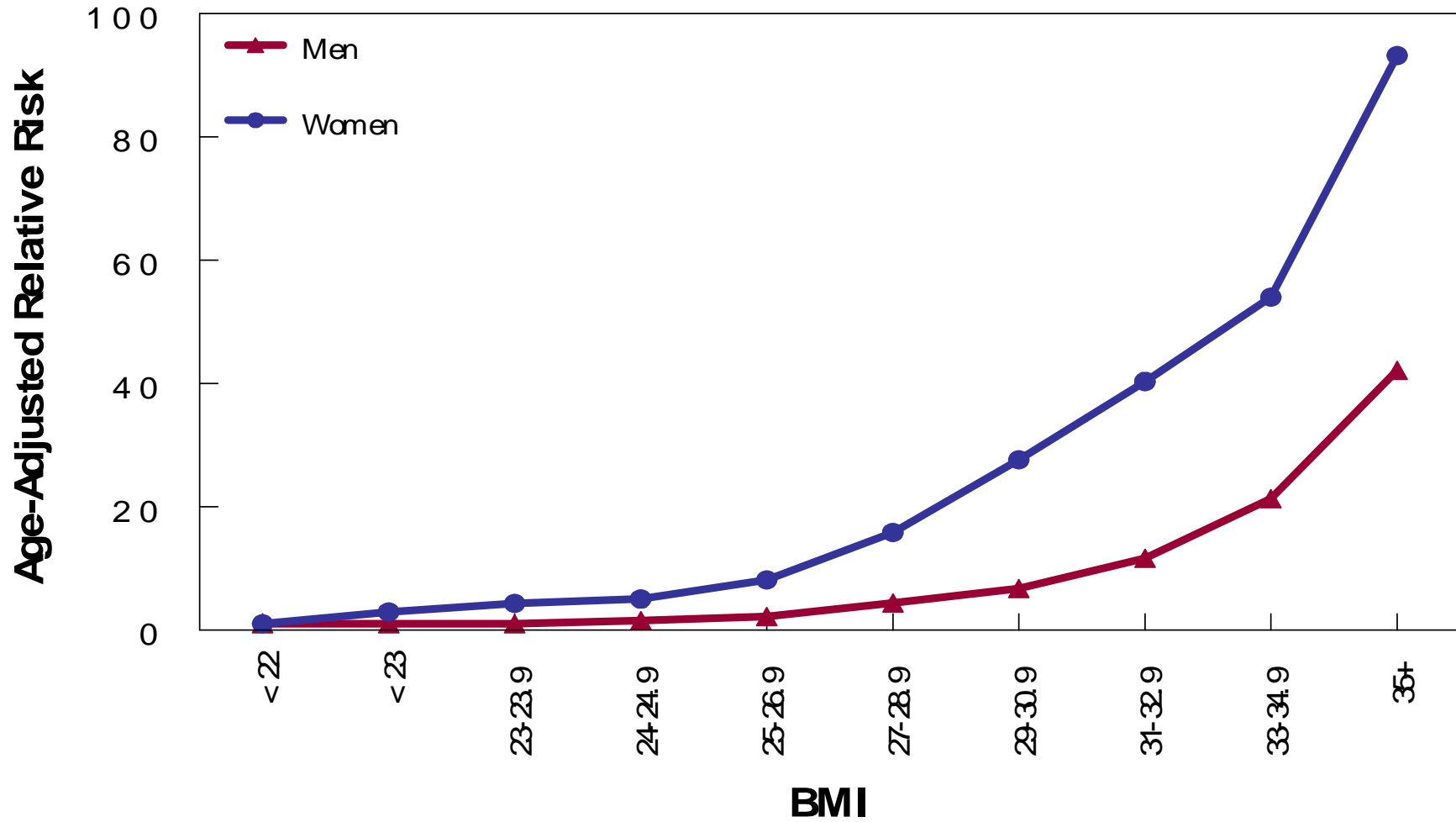


# Prevalence of Hypertension Among Six Populations of West African Origin: ICSHIB, 1995



Hypertension defined as Systolic Blood Pressure  $\geq 140$  or Diastolic Blood Pressure  $\geq 90$  or taking Anti-hypertension Medication

# Relationship between BMI and Risk of Type 2 Diabetes Mellitus



Measures to improve public health, relating as they do to such obvious and mundane matters as housing, smoking, and food, may lack the glamour of high-technology medicine, but what they lack in excitement they gain in their potential impact on health, precisely because they deal with the major causes of common disease and disabilities.

Geoffrey Rose, *The strategy of preventive medicine*. Oxford University Press, 1992



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# Ottawa Charter (WHO 1986)

The fundamental conditions and resources for health are:

Peace

Shelter

Education

Food

Income

A stable eco-system

Sustainable resources

Social justice

Equity

Social investment in health –

What is the role of the state?

Will improvement in health status be independent of economic development?

Is it necessary to tie health interventions to market-driven economic strategies?

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# Economic and Political Forces that Influence Health in many African Countries

## **Weak economic base**

Little or no industry, limited mineral/petroleum resources, recent loss of agricultural markets

## **High levels of indebtedness; great social inequalities**

## **Limited political independence**

Colonial legacy of “first world” domination; weak/non-existent democratic institutions

## **Defeat of post-colonial independence movements – absence of alternative to World Bank/IMF development schemes**

## **Chronic wars and political instability**

## **Absence of regional political identity**

## **Weak presence of the state, particularly in the provision of social services; Lack of comprehensive health care services**

# Improving Health Status in the Developing World Lessons from the Cuban example

## Social and Demographic Indicators in the Caribbean and US

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	Jamaica Republic	Dominican	Cuba	US
Life Expectancy	76	67	76	77
Infant Mortality	10-20 ?	42	6.5	6.8
GNP <sup>1</sup>	2,710	2,230	1- 5,000 ?	31,000
Health Expenditure <sup>1</sup>	208	357	193	4,400

<sup>1</sup> per capita, US \$

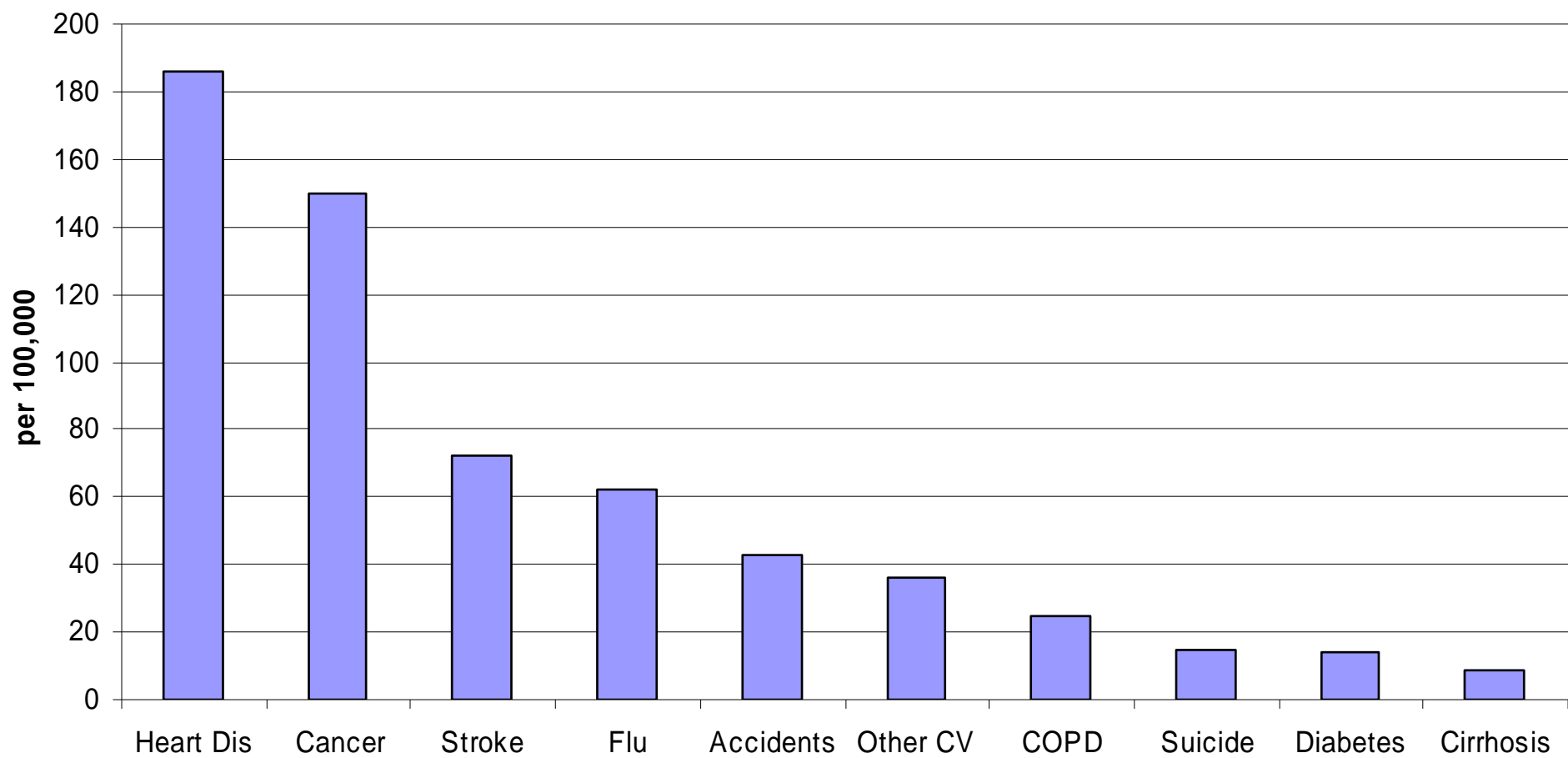
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# Cuba's Accomplishments in Public Health

- Comprehensive health care; 1 physician / 120 families
- Eliminated polio in 1962 (first in the world; US free of polio in 1979)
- Eliminated measles in 1996 (only country in the world)
- Lowest AIDS rate in the Americas
- Best dengue control program in the Americas
- Best treatment & control of hypertension in the world
- Provides doctors for 52 poor countries
- Offers free medical education for students from Africa and Latin America
- Developed and put into practice a “comprehensive health plan for the Americas”
- Developed a strong bio-tech industry

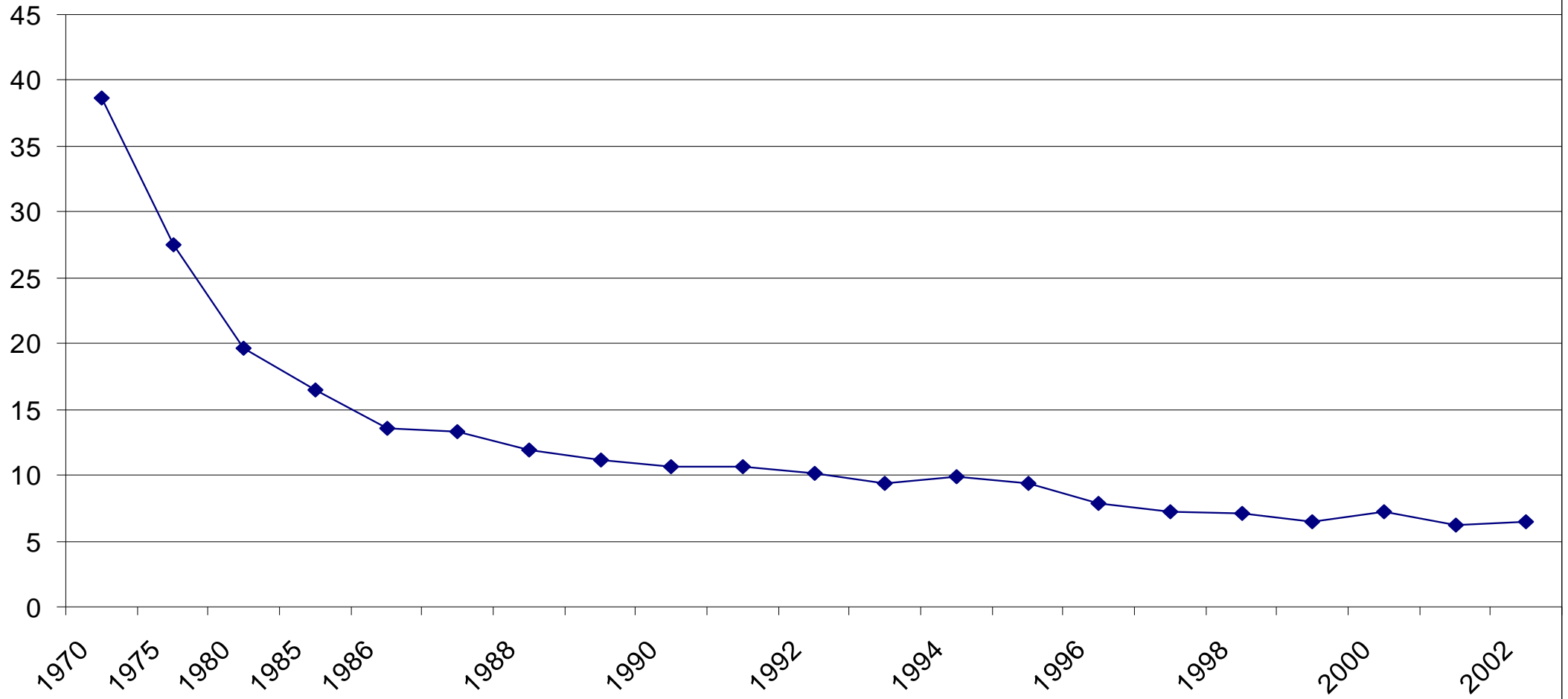


## Principle Causes of Mortality, Cuba, 2001

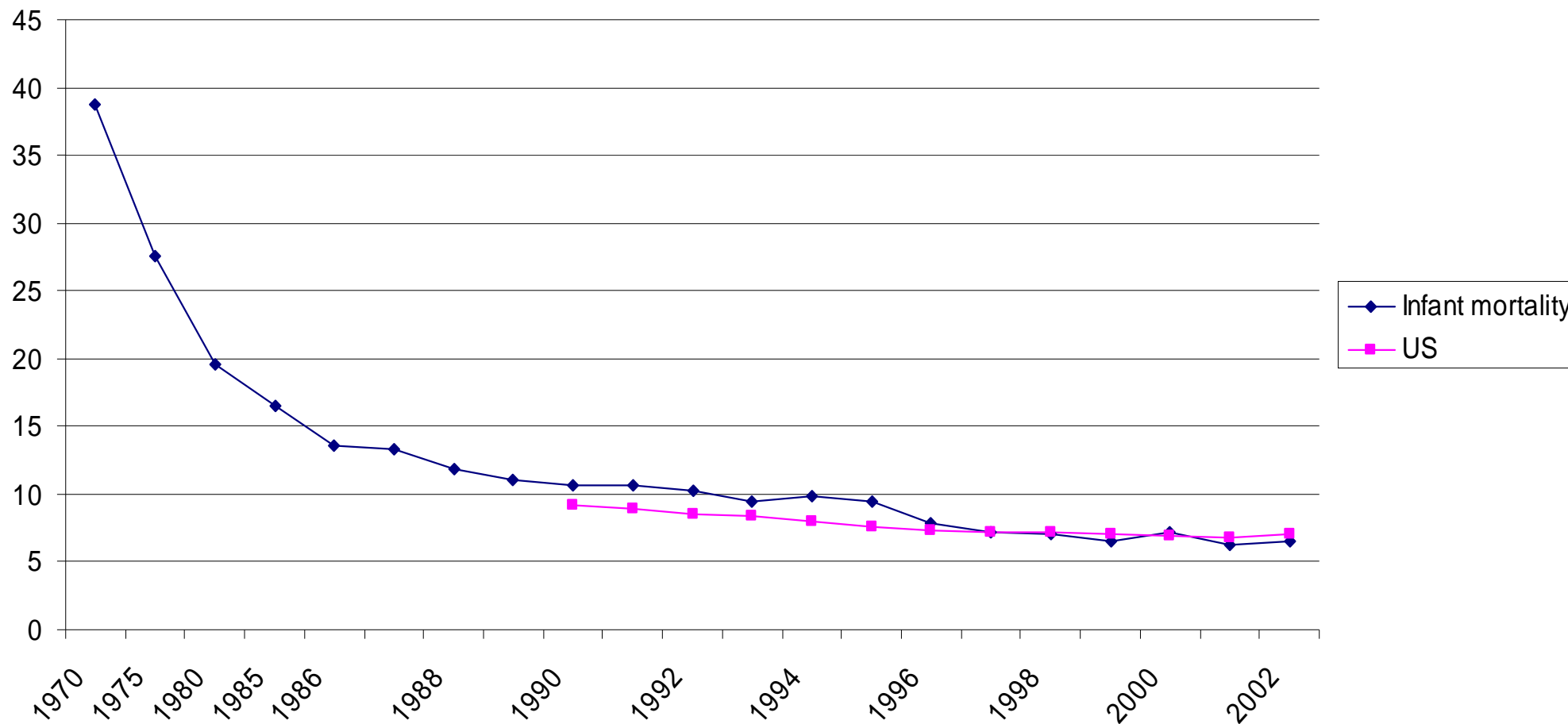


# Infant Mortality in Cuba, 1970-2002

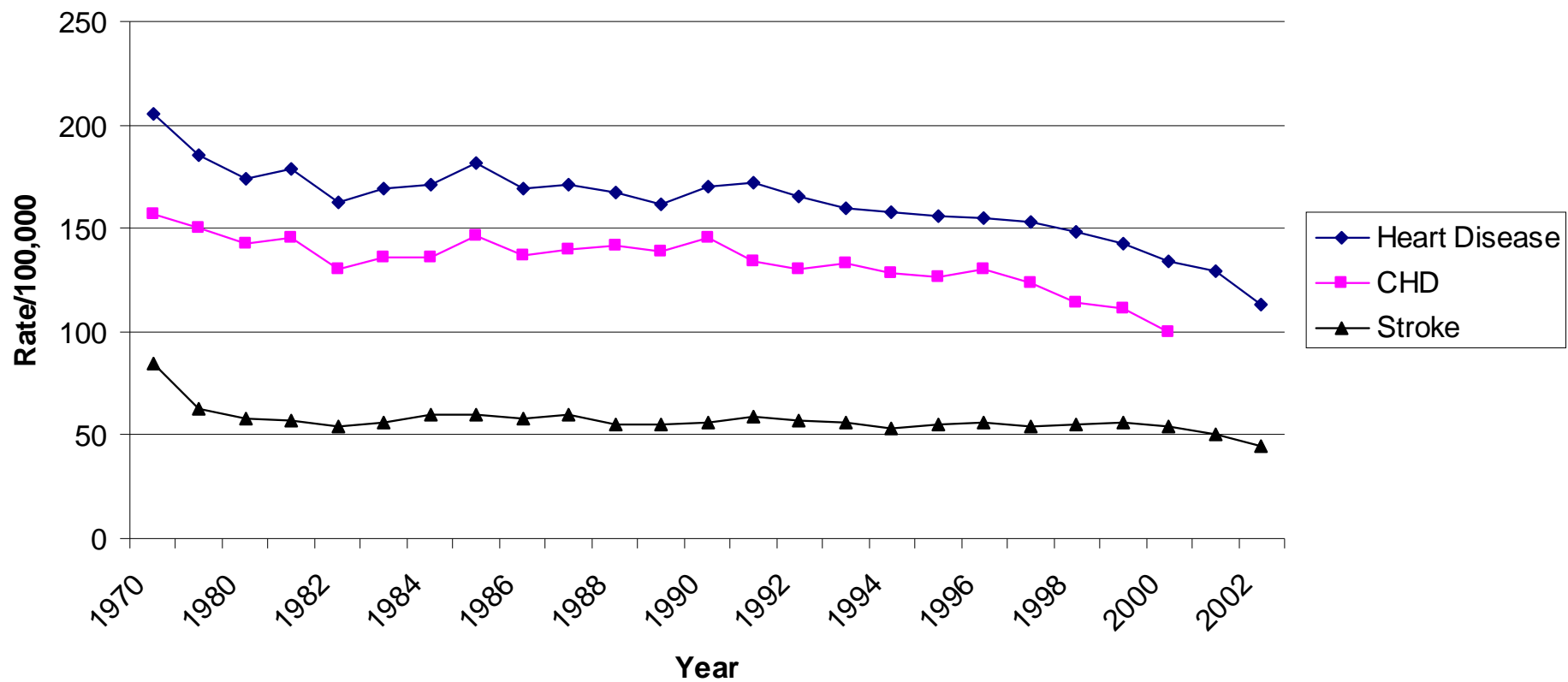
(Rate per 1,000)



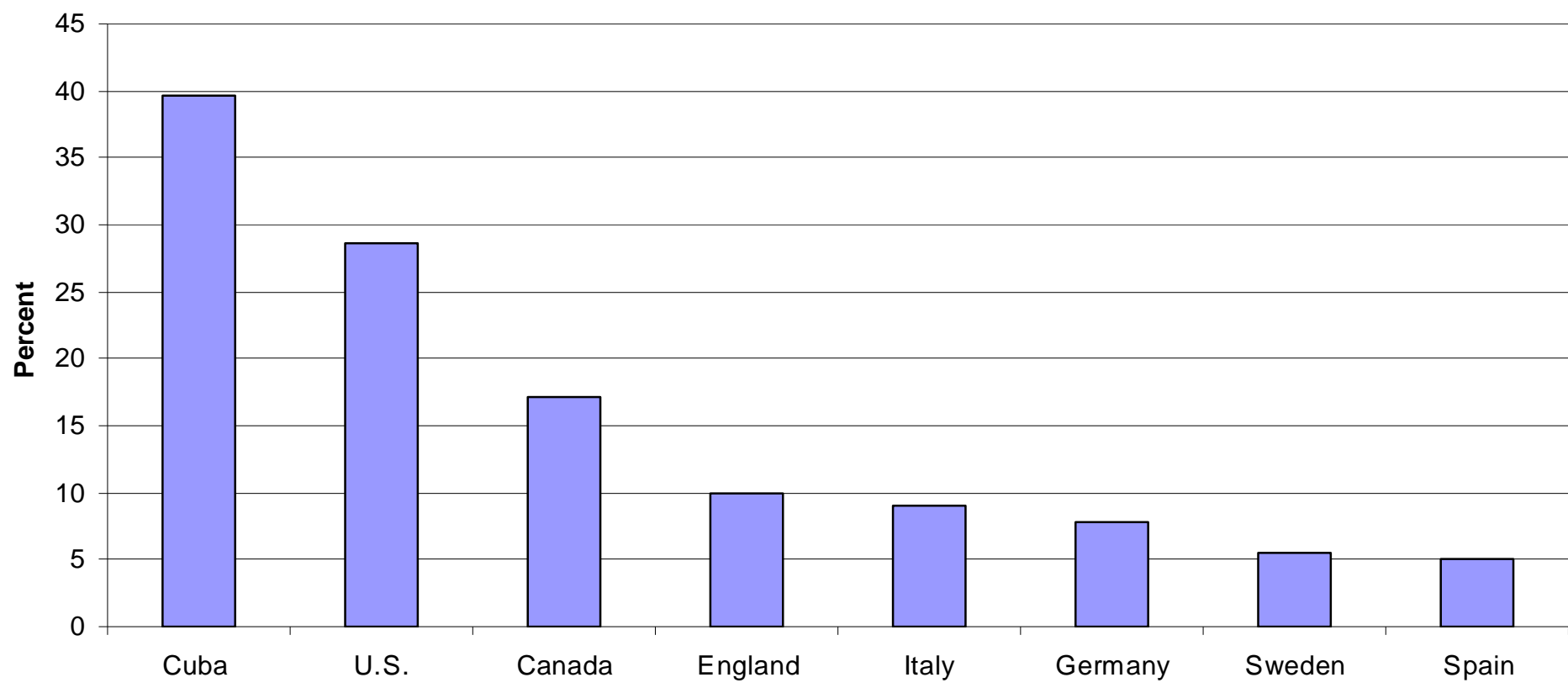
### Infant Mortality, Cuba and US



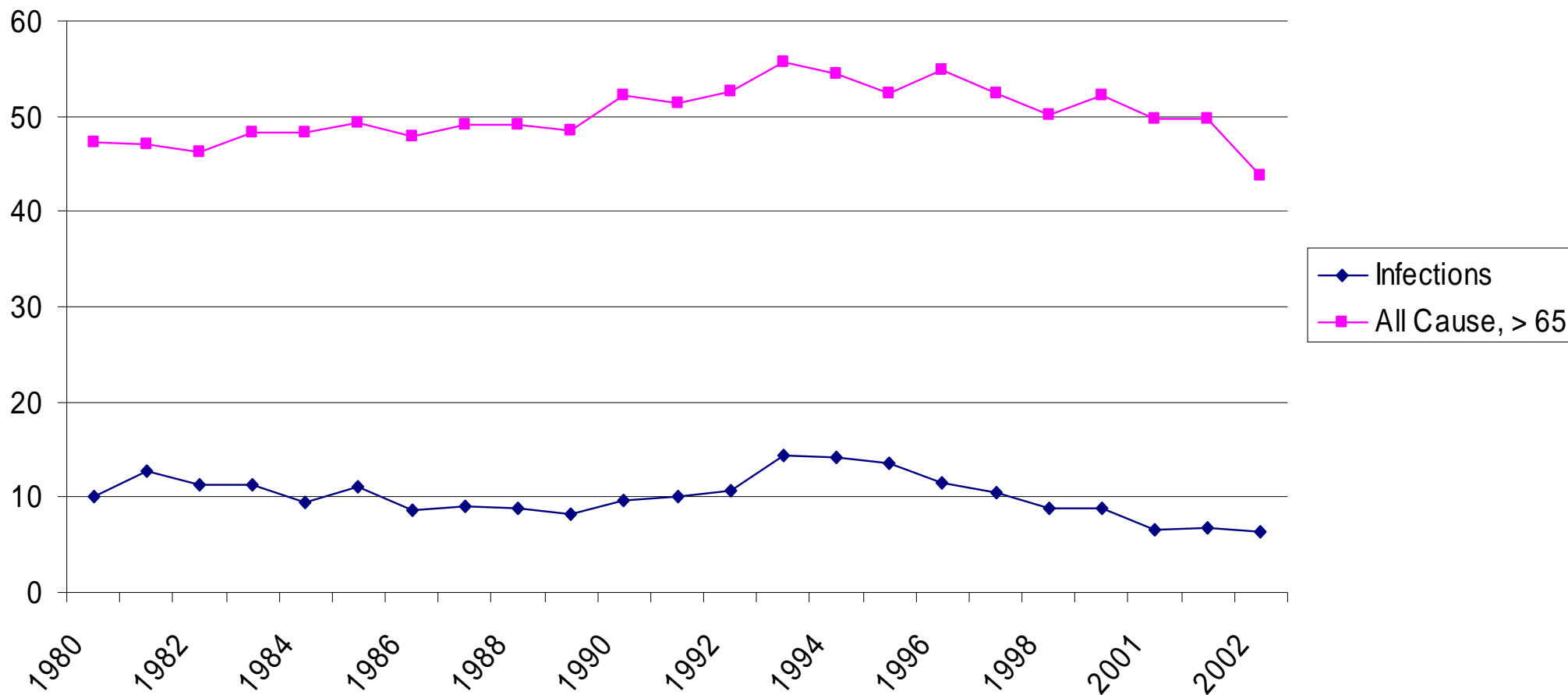
Age-Adjusted Trends in CVD Mortality, Cuba, 1970-2002



# Hypertension Treatment and Control Rate, Cuba, North America, and Selected European Countries (BP < 140/90 mmHg)



**Trends in All Cause Mortality Among Persons over Age 65,  
and Infection at all Ages, Cuba**



# Smoking Prevalence by Age and Sex, Cuba, 1992 and 2002

