Healthy Caribbean 2008: A Wellness Revolution Conference October 16-18, 2008 Barbados

Revolutionizing the Prevention and Management of Hypertension & Heart Disease

Rainford Wilks

Epidemiology Research Unit- TMRI
The University of the West Indies

Outline

- Approaches to the CNCD epidemic
- Evidence of the burden in Jamaica & the region
- Two main approaches
  - Shifting the distribution to the left
  - Improved detection and management
- Partnerships to achieve health
- Practical steps & essential requirements
- CVD Risk Charts

Cardiovascular diseases

- Hypertension (risk factor)
- Coronary artery disease
  - myocardial infarction, angina pectoris, congestive heart failure
- Stroke
- Peripheral vascular disease
- Kidney Disease
- Diabetes mellitus?

"The Population vs The Deviants" 1

- *"The population mean predicts the number of deviant individuals"*

- *"Objective- To examine the relation between the prevalence of deviation and the mean for the whole population in characteristics such as blood pressure and consumption of alcohol"*

Rose & Day. *BMJ* 1990

"The Population vs The Deviants" 2

- *"Conclusions- These findings imply that distributions of health related characteristics move up and down as a whole: the frequency of "cases" can be understood only in the context of population's characteristics. The population thus carries a collective responsibility for its own health and well being, including that of its deviants."*
- *"There are profound implications here for researchers, for preventive policy, and for societies and their governments"*

Rose & Day. *BMJ* 1990

Distribution vs Mean: Inter-Salt Study

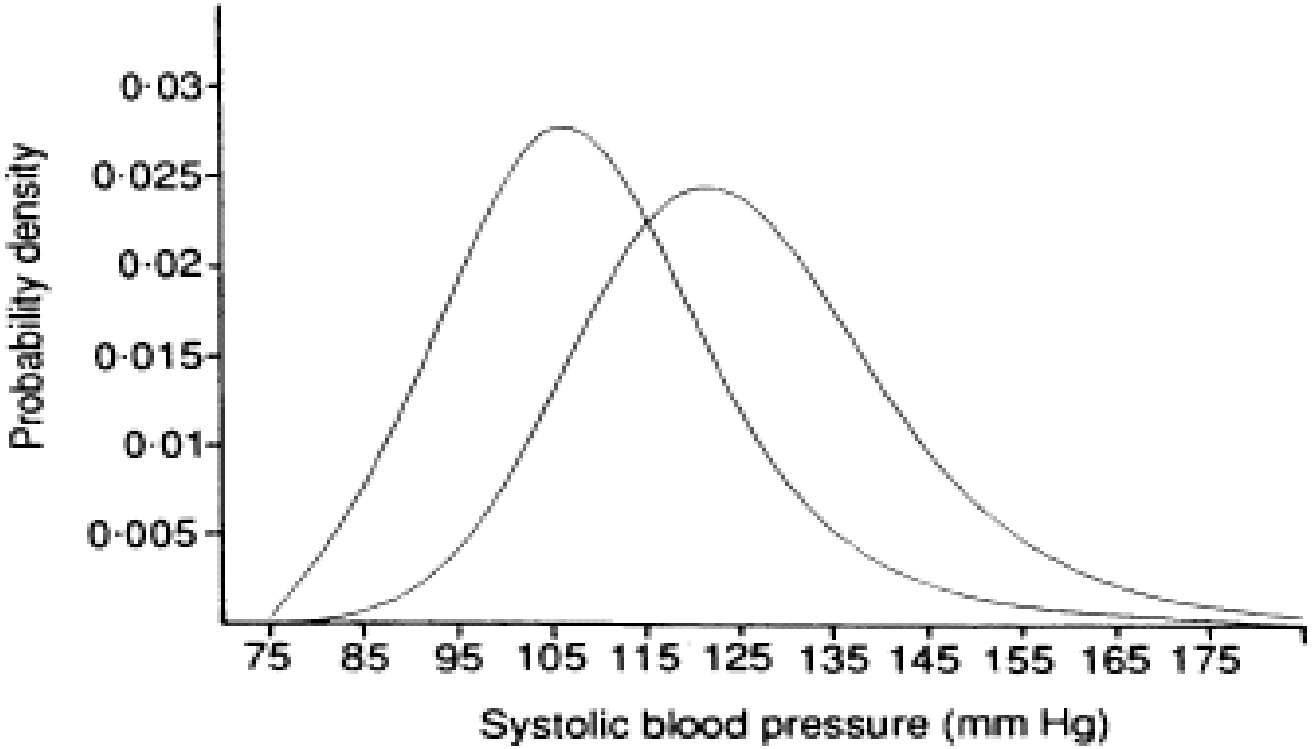


FIG 1—*Distributions of systolic blood pressures for averages of the five populations with the lowest mean values and the five with the highest*

Rose & Day. *BMJ* 1990

Impact of Mean on Prevalence

- Estimated 1% fall in hypertension PREVALENCE for every 1mmHg fall in MEAN BP

Lifestyle Benefits to Blood Pressure

TABLE 9. Lifestyle Modifications To Prevent and Manage Hypertension*

Modification	Recommendation	Approximate SBP Reduction (Range)†
Weight reduction	Maintain normal body weight (body mass index 18.5–24.9 kg/m^2).	5–20 mm Hg/10 kg[92,93]
Adopt DASH eating plan	Consume a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated and total fat.	8–14 mm Hg[94,95]
Dietary sodium reduction	Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride).	2–8 mm Hg[94–96]
Physical activity	Engage in regular aerobic physical activity such as brisk walking (at least 30 minutes per day, most days of the week).	4–9 mm Hg[97,98]
Moderation of alcohol consumption	Limit consumption to no more than 2 drinks (eg, 24 oz beer, 10 oz wine, or 3 oz 80-proof whiskey) per day in most men and to no more than 1 drink per day in women and lighter-weight persons.	2–4 mm Hg[99]

DASH indicates Dietary Approaches to Stop Hypertension.

*For overall cardiovascular risk reduction, stop smoking.

†The effects of implementing these modifications are dose- and time-dependent and could be greater for some individuals.

JNC7 *Hypertension* 2003

Benefits of Drug Rx to CVD

- In the presence of BP >150/90 & T-Chol >5.0 mmol/L
- Using anti-hypertensive & STATIN drugs to achieve:
  - 10-15 mmHg decrease in SBP
  - 5-8 mmHg decrease in DBP
  - 20% decrease in T-Chol
- Would yield 50% reduction in CVD mortality and morbidity

Wald & Law. *BMJ* 2003; *WHO* Guidelines 2007

Examples of Regional Burden

Cardiovascular Risk Factors in Jamaica 2000-01

Table 2: Crude and sex-specific prevalence of cardiovascular disease risk factors in the Jamaica Lifestyle Survey 2000–2001.

Characteristics	Male (N = 661)	Female (N = 1311)	Total (N = 1972)
	% (95% CI)	% (95% CI)	% (95% CI)
Obesity** (BMI ≥ 30 kg/m^2)	9.0 (6.8–11.3)	30.0 (26.8–33.2)	19.7 (17.4–22.0)
Overweight** (BMI ≥ 25 kg/m^2)	30.2 (25.7–34.6)	60.7(57.4–64.0)	45.7 (42.6–48.9)
Increased Waist Circumference**	14.6 (11.6–17.6)	56.7 (53.2–60.2)	36.0 (33.0–39.0)
Increased Waist/Hip ratio**	6.1 (4.0–8.1)	54.4 (50.6–58.2)	30.5 (27.9–33.2)
Hypercholesterolaemia*	11.6 (8.8–14.5)	17.4 (15.1–19.8)	14.6 (12.7–16.5)
Diabetes Mellitus	6.3 (4.3–8.3)	8.0 (6.6–9.4)	7.2 (6.0–8.3)
[1]Cigarette Smoking**	28.3 (24.1–32.5)	7.3 (5.6–8.9)	17.6 (15.2–20.1)
Low Physical activity**	21.3 (17.3–25.4)	50.9 (46.8–54.9)	36.3 (33.0–39.7)

[1] Currently smokes cigarettes regardless of quantity per day.
* P < 0.01 (male – female difference in proportions)
** P < 0.001 (male – female difference in proportions)

Ferguson et al. BMC CVD 2008

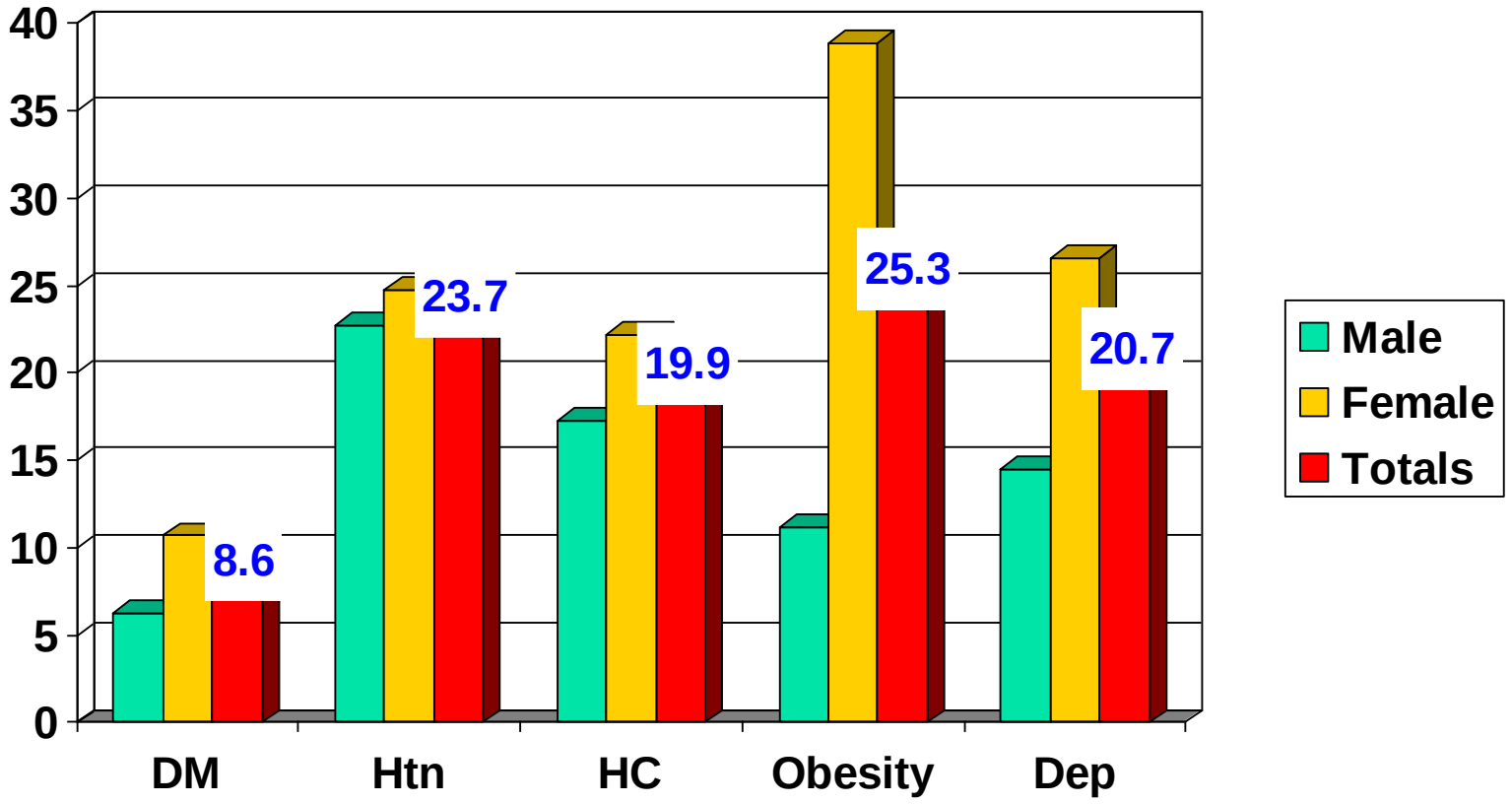
Prevalence of CVD risk factors within and across gender

Health Indicator	Males	Females	Total
Diabetes	2.4	1.5	2.0
Hypertension	5.0	3.2	4.1
Prehypertension**	34.5	23.5	29.1
Hyperlipidaemia	1.0	1.0	1.0
Overweight (BMI≥25kg/m^2)**	14.9	23.8	19.3
Obesity (BMI ≥30 kg/m^2)*	4.1	7.4	5.7
Underweight	14.8	15.6	15.2
Increased waist circumference***	2.2	15.1	8.6
Increased Waist Hip Ratio (WHR)***	0.6	18.6	9.5

*p<0.05; ** p<0.01; *** p<0.001

Jamaica Youth Risk & Resiliency Behaviour Survey 2006

Sex Specific Prevalence (%) of Measured Health Indicators in Jamaicans 15-74 Years (JHLSII '08)



Sex Specific Prevalence (%) of Risk factors for Health Indicators (JHLSII '08)

Disease Condition	Male	Female	Total
Impaired Fasting Glucose	5.1	2.7	3.9
Prehypertension	43.6	28.9	36.1
Overweight (BMI 25.0-29.9)	27.1	24.7	24.9

Awareness levels (%) of Chronic Diseases (JHLSII '08)

Disease	Male	Female	Total
Hypertension	32.9	77.6	56.7
Diabetes	64.8	77.5	72.9
High Cholesterol	23.0	15.9	18.0

Treatment levels (%) of Chronic Diseases (JHLSII '08)

Disease	Male	Female	Totals
Hypertension	17.9	58.2	39.4
Diabetes	59.4	72.5	67.8
High cholesterol	14.9	9.5	11.1

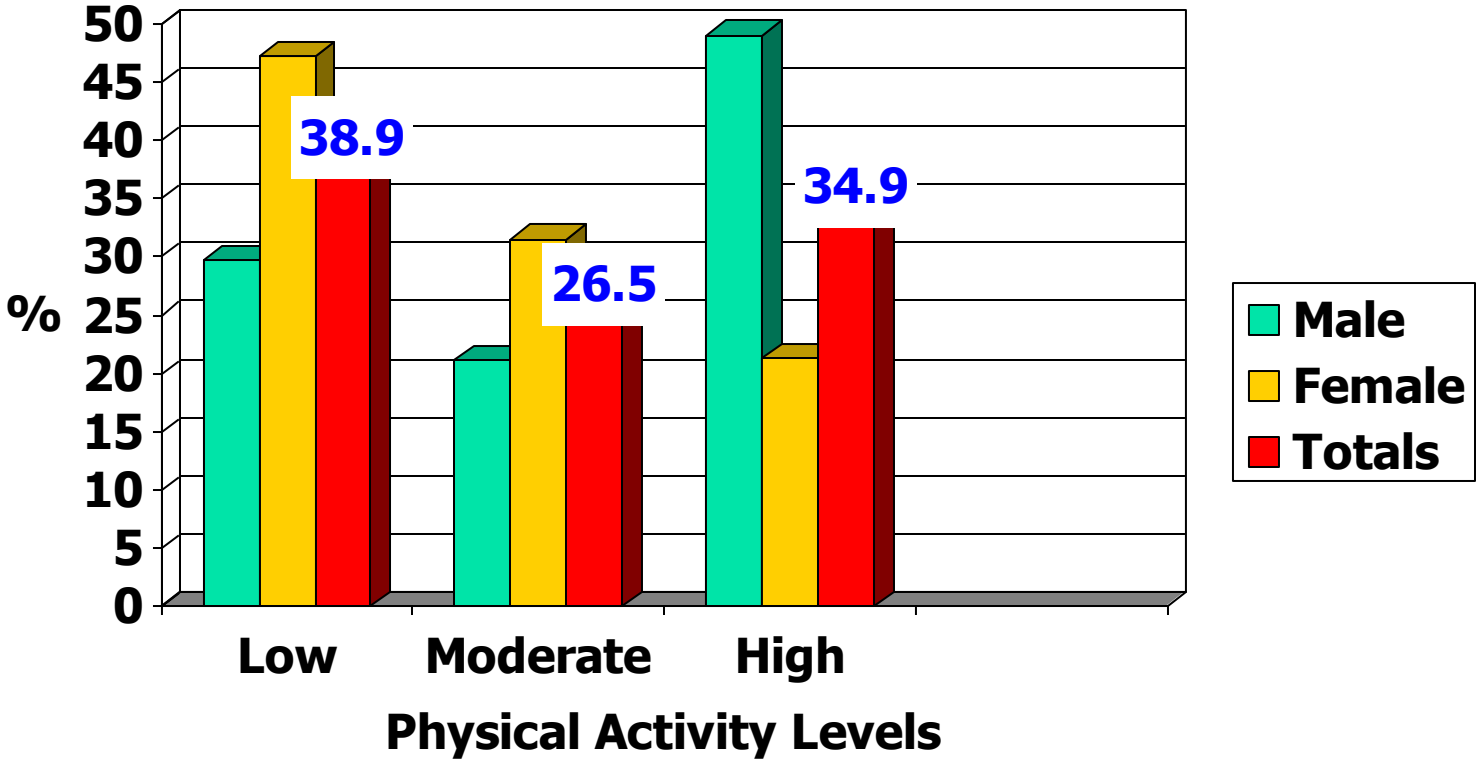
Sex specific Control Rates (%) of persons on treatment for cited health conditions (JHLSII 08)

Disease	Male	Female	Totals
Hypertension	34.9	46.9	44.3
Diabetes	57.9	52.2	54.0
High Cholesterol	58.4	68.9	64.2

Chronic Disease Trend
JHLS1 vs JHLS11

	2000			2007		
	PREVALENCE %	AWARENESS %	TREATMENT %	PREVALENCE %	AWARENESS %	TREATMENT %
DM	7.2	76.3	67.4	8.6	72.9	67.8
HTN	20.8	55.3	42.0	23.7	56.7	39.4
HC	14.7			19.9	18.0	11.1
OBESITY	19.7	-	-	25.3	-	-

Physical Activity Categories by Sex (JHLSII '08)



Strategies to Respond to the 'Epidemic'

- Efficient systems to estimate CNCD burden and secular trends
- Estimation of risk factors for CNCD.
- Identification of the determinants of health behaviours
- Develop a health policy to address population based approach to diseases.
- Make efficient the treatment approaches to those already afflicted

Reddy & Yusuf, *Circulation 1998*

Overarching Approach

- Shifting the population MEAN to the LEFT

- Improved DETECTION and MANAGEMENT

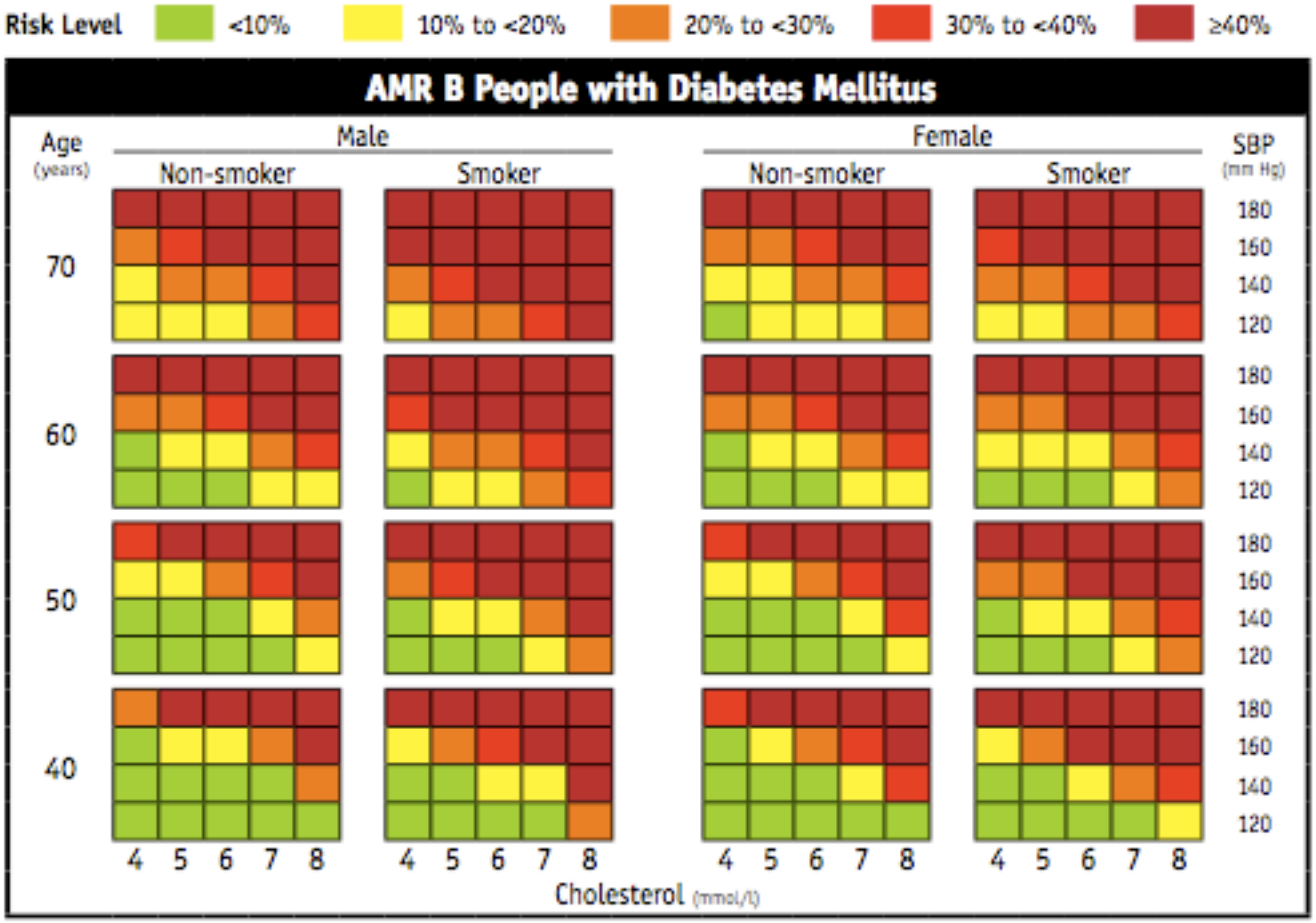
WHO CVD Risk Charts

- Many CVD risk factors cluster (Age, Htn, DM, smoking, obesity, hyperlipidaemia)
- The impact of coincident risk factors is more multiplicative than additive
- Combined impact is best estimated from cohort studies – often unavailable in developing countries
- Colour coded Risk Charts have been available in developed countries for many years

WHO CVD Risk Charts

- The WHO has derived Colour-coded Risk charts for developing countries on the best evidence available
- These Charts are region-specific
- Charts can be used by lower levels of health care professionals to quickly identify risk
- Charts can guide the intensity of intervention

CVD Risk Charts



High Risk – Charts not required

- BP $\geq$180/100
- Blood cholesterol $\geq$ 8.0 mmol/l
- Established Ischaemic Heart Disease
- Diabetes with renal disease

Strategic Approaches

- Advocacy for effective policy development
- Strengthening health services
- Human resources health – "fit for purpose"
- Multi-sectorial partnerships
- Improved capacity for the CNCD information "market"

Essential Partners

- Government
  - Health
  - Agriculture & Trade
  - Finance and economics
  - Public works and transportation
  - Local government
  - Statistical Institutes & Vital Registries
- NGOs
- Professional Associations
- Academic institutions
- Private sector e.g. Insurance companies
- Regional and sub-regional institutions

Some Practical Steps - 1

- Community goals must include markers of the desired outcome e.g. number of playfields per capita
- Improved detection must include increased role for NGOs (HFs, DAs)
- Increased capacity of health service to respond to the detected cases
- Improved monitoring must include the provision of subsidized home BP monitors
- Health promotion must aim to increase awareness of GOALS for each risk factor (BP, WC, FBS, Cholesterol)

Some Practical Steps - 2

- Take advantage of situations where screening is done routinely
  - Life insurance medical exams
  - College & University student medical exams
  - Work place medical exams – especially where these take place in large group-private practices
  - Annual high school medical exams

- Create an accessible interface between these organizations and the national health system

Essential Requirements

- Trained human resources with appropriate skill mix – new roles for public health inspectors and public health nurses?
- An appropriate ICT platform to accommodate this new interface between these diverse organizations already gathering the data
- Strategic improvements in the health care system to accommodate increased demand

Investigators

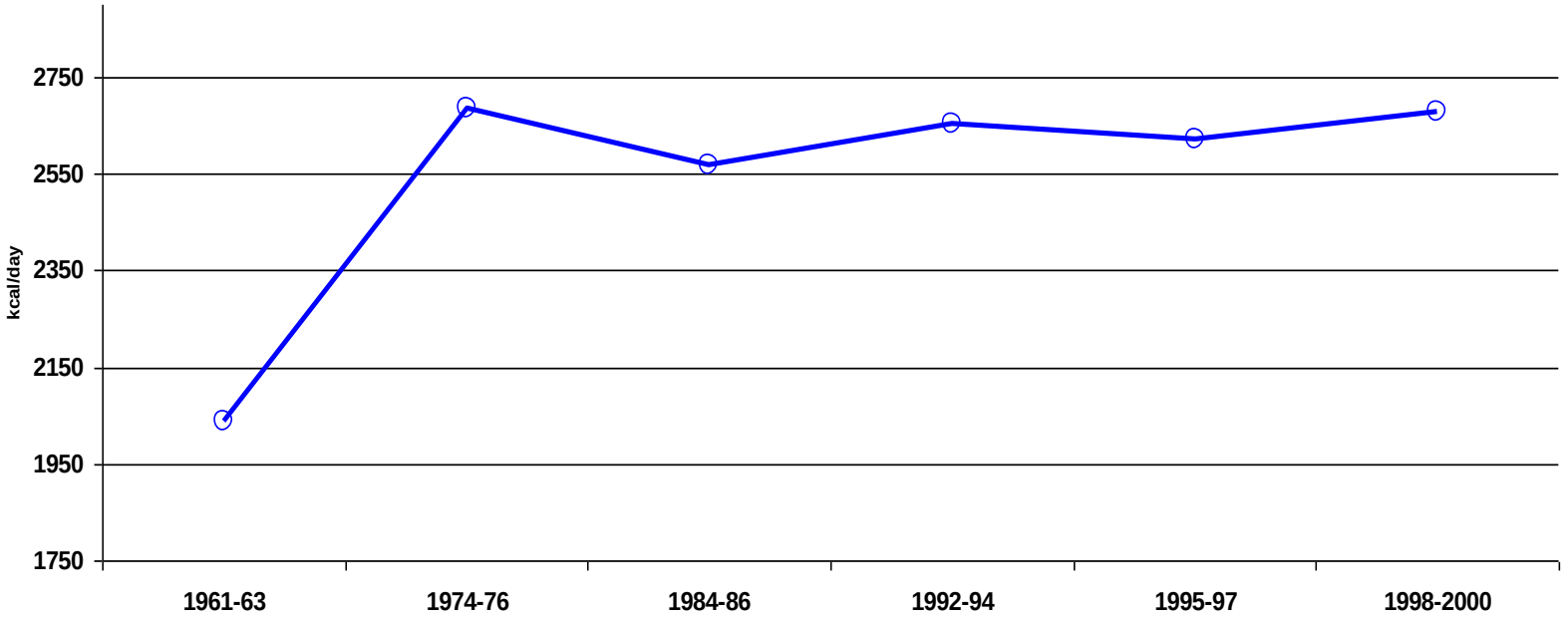
- Damian Francis*
- Novie Younger*
- Shelly McFarlane*
- Trevor Ferguson*
- Marshall Tulloch-Reid*
- Jan Van den Broeck*
- Rainford Wilks* (Principal Investigator)
- Georgiana Gordon-Strachan**
- Andriene Grant***
- Ayesha Johnson***

***Epidemiology Research Unit, TMRI; **FMS, UWI, Mona; ***Ministry of Health, Jamaica**

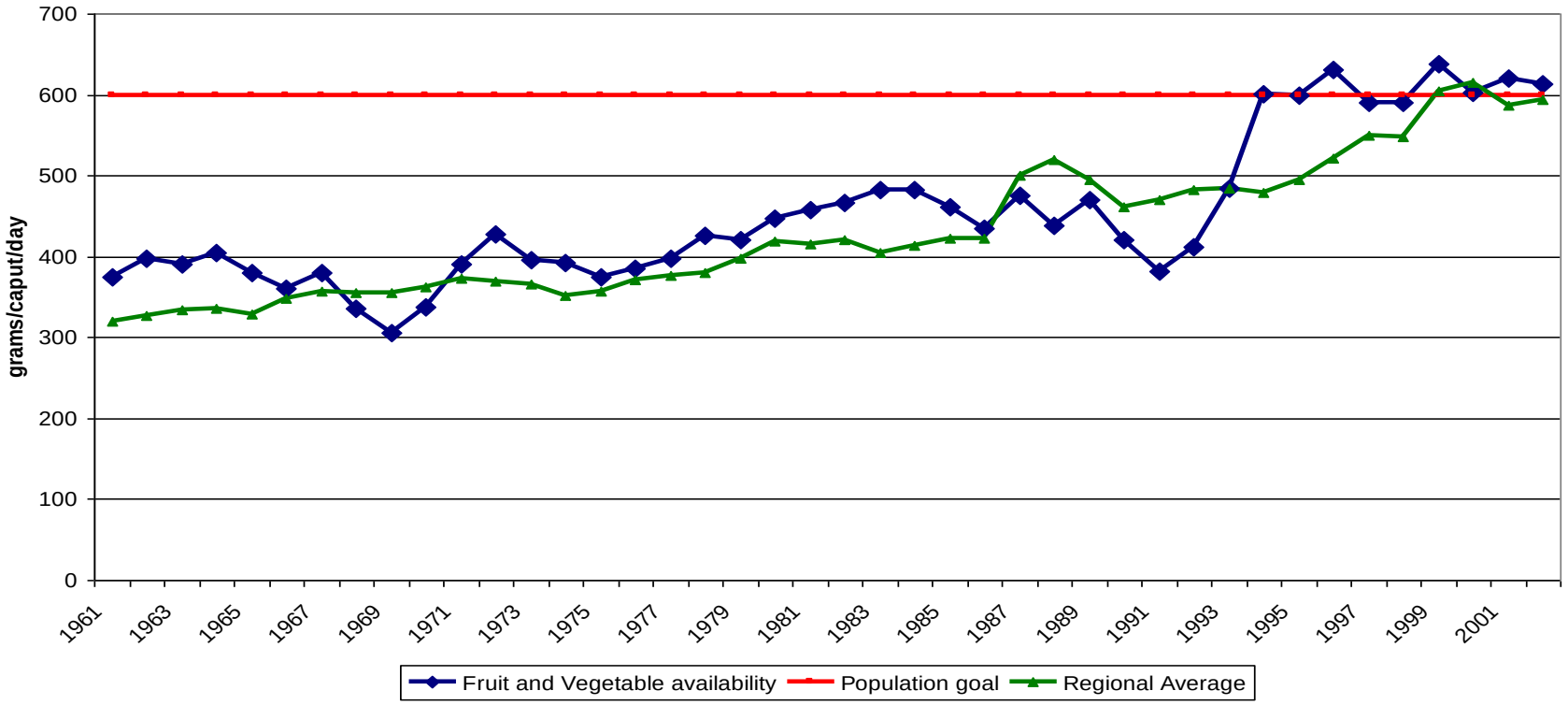
Acknowledgements

- Heart Foundation of Jamaica
  - Dr. Knox Hagley
  - Mrs. Deborah Chen
- Funding
  - Ministry of Health (Jamaica)
  - IDB
  - USAID
  - NHF (Jamaica)
  - CHASE Fund (Jamaica)
  - IC-Health

Jamaica Per Caput Energy Availability (kcal/day) - 1961-2000



Availability of Fruit and Vegetables in Jamaica 1961-2002



Leading causes of death at all ages by sex for a three-year period: 1996-1998

Cause of Death	Death Rate Per 100,000 Mean population		
	Total	Male	Female
Cerebrovascular Diseases	77.9	69.4	86.3
Heart Diseases	76.5	70.9	62.1
Diabetes Mellitus	62.0	47.7	76.2
Hypertensive Diseases	32.1	27.6	36.6
Pneumonia	19.4	20.9	18.0

Jamaica is in epidemiological transition. As such, more of the cardiovascular diseases have become the leading causes of death over the last fifty years.