DIABETES AND DEPRESSION

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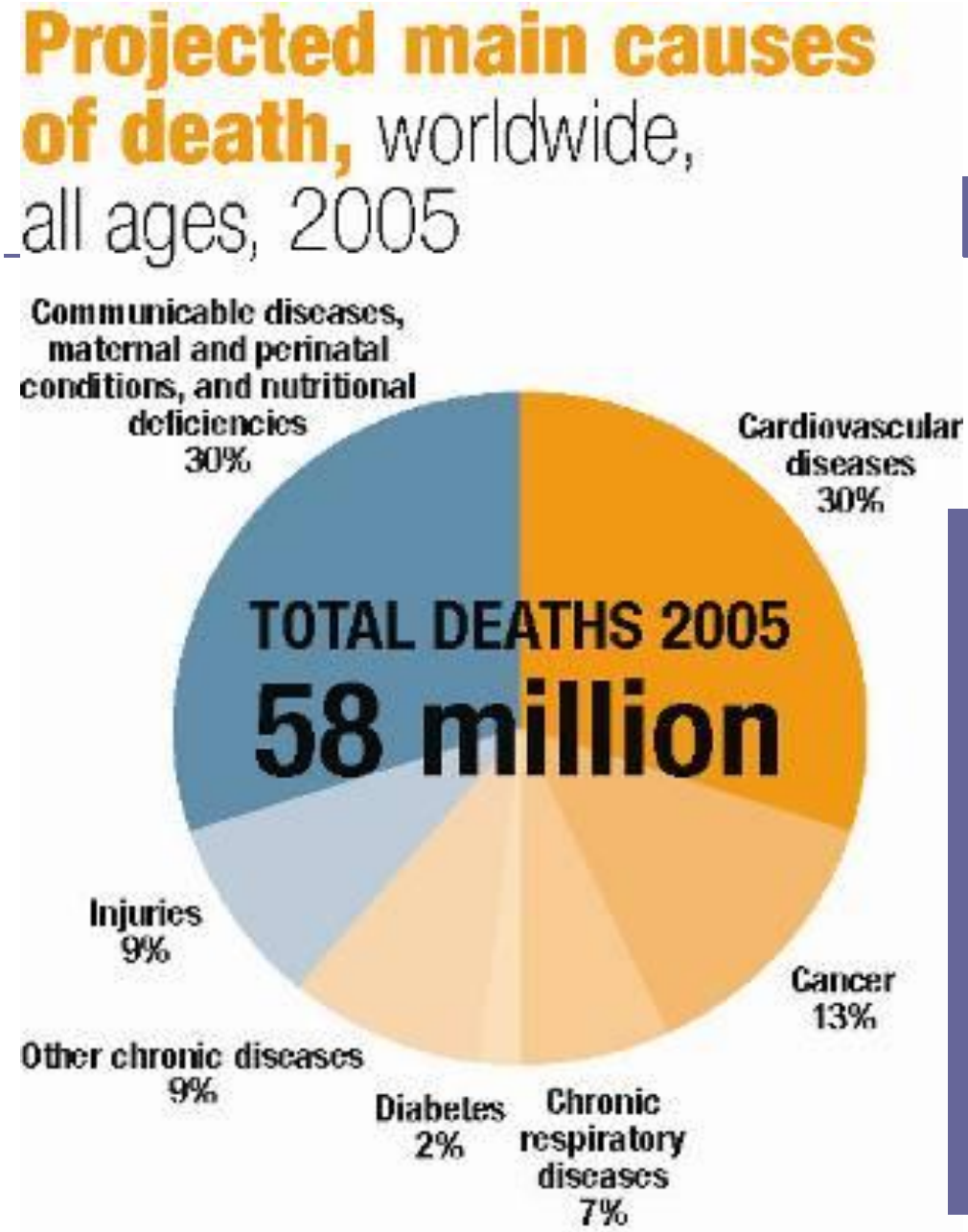
FLINDERS & DEAKIN UNIVERSITIES

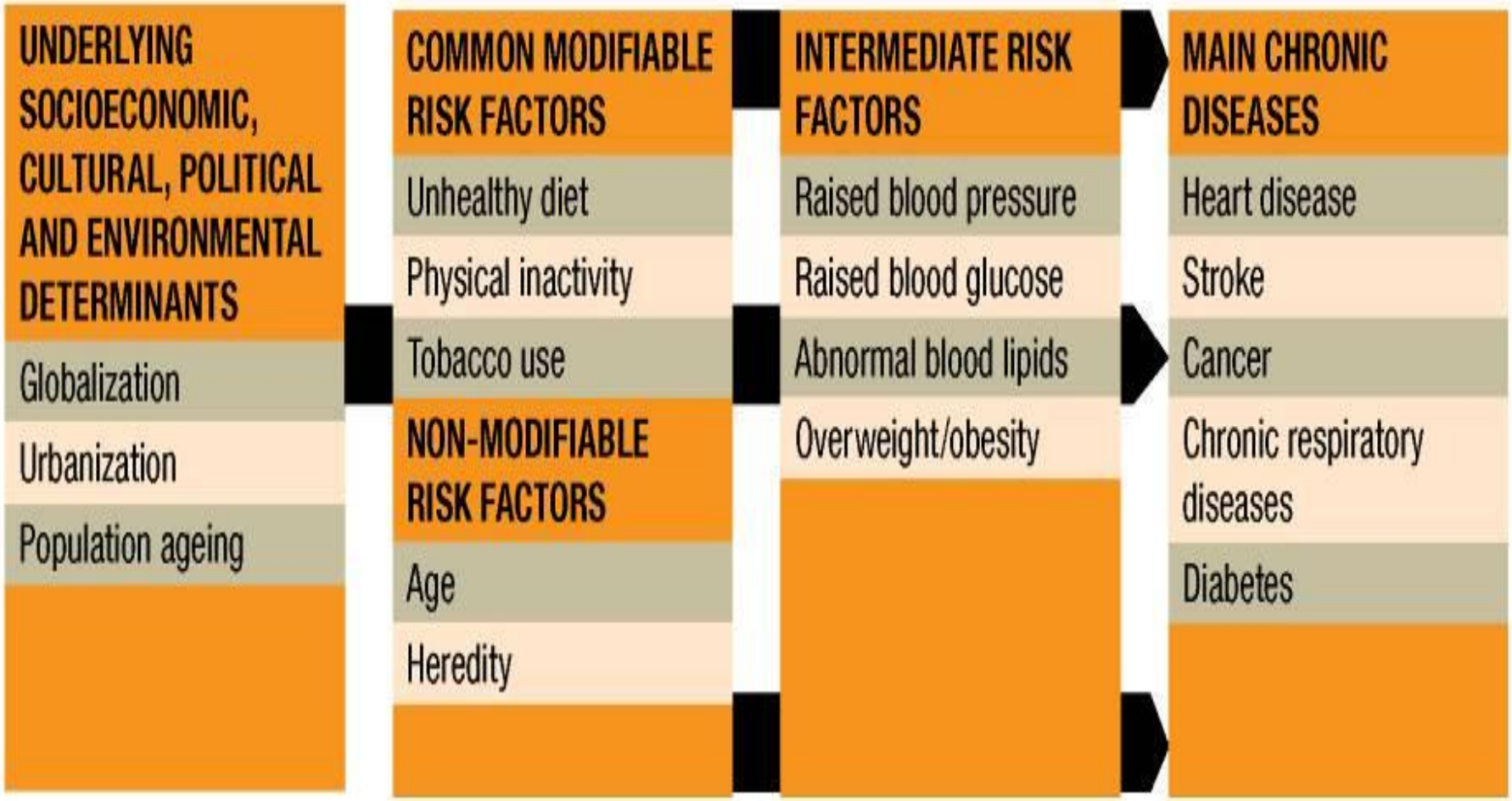
# OPENING THE GATES ON FARMER HEALTH OCT 2010 HAMILTON



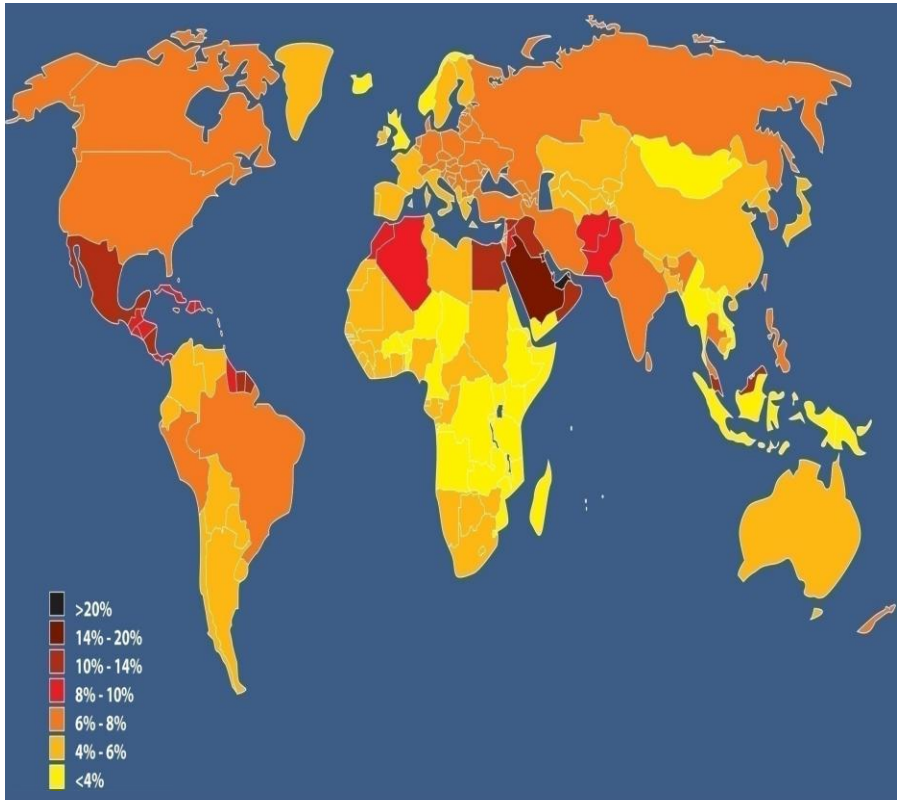

www.who.int/chp

**Cardiovascular disease, mainly heart disease, stroke**
**Cancer**
**Chronic respiratory diseases**
**Diabetes**

# Causes of chronic diseases

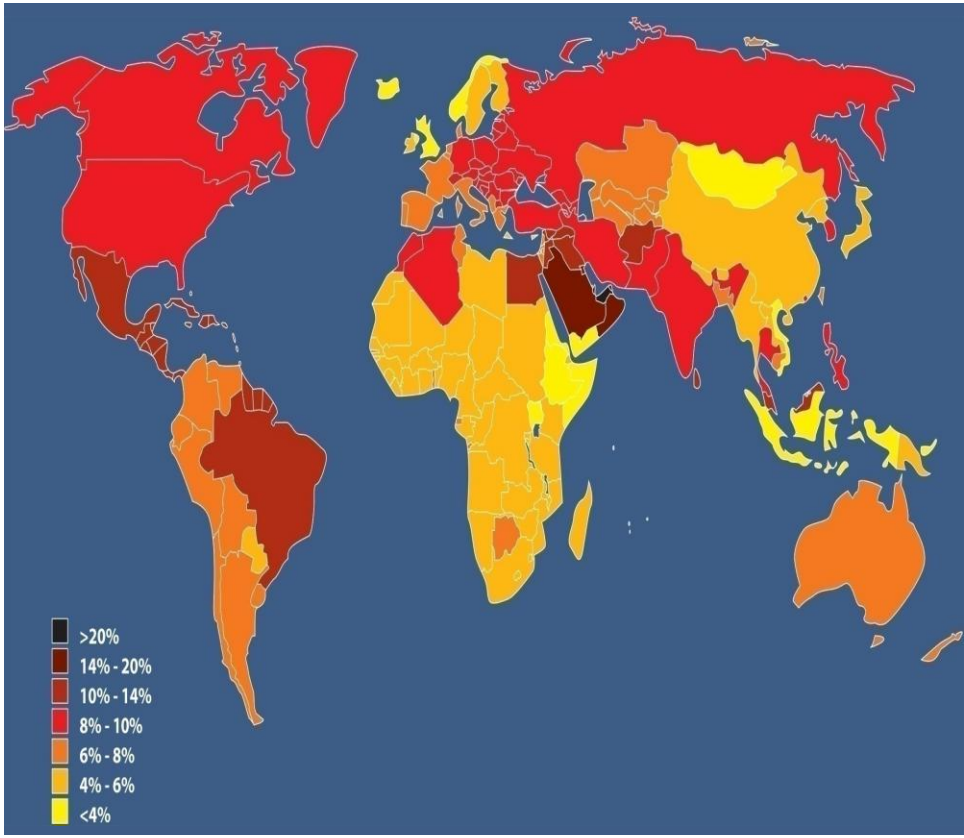


## PREVALENCE ESTIMATES OF DIABETES, 2007



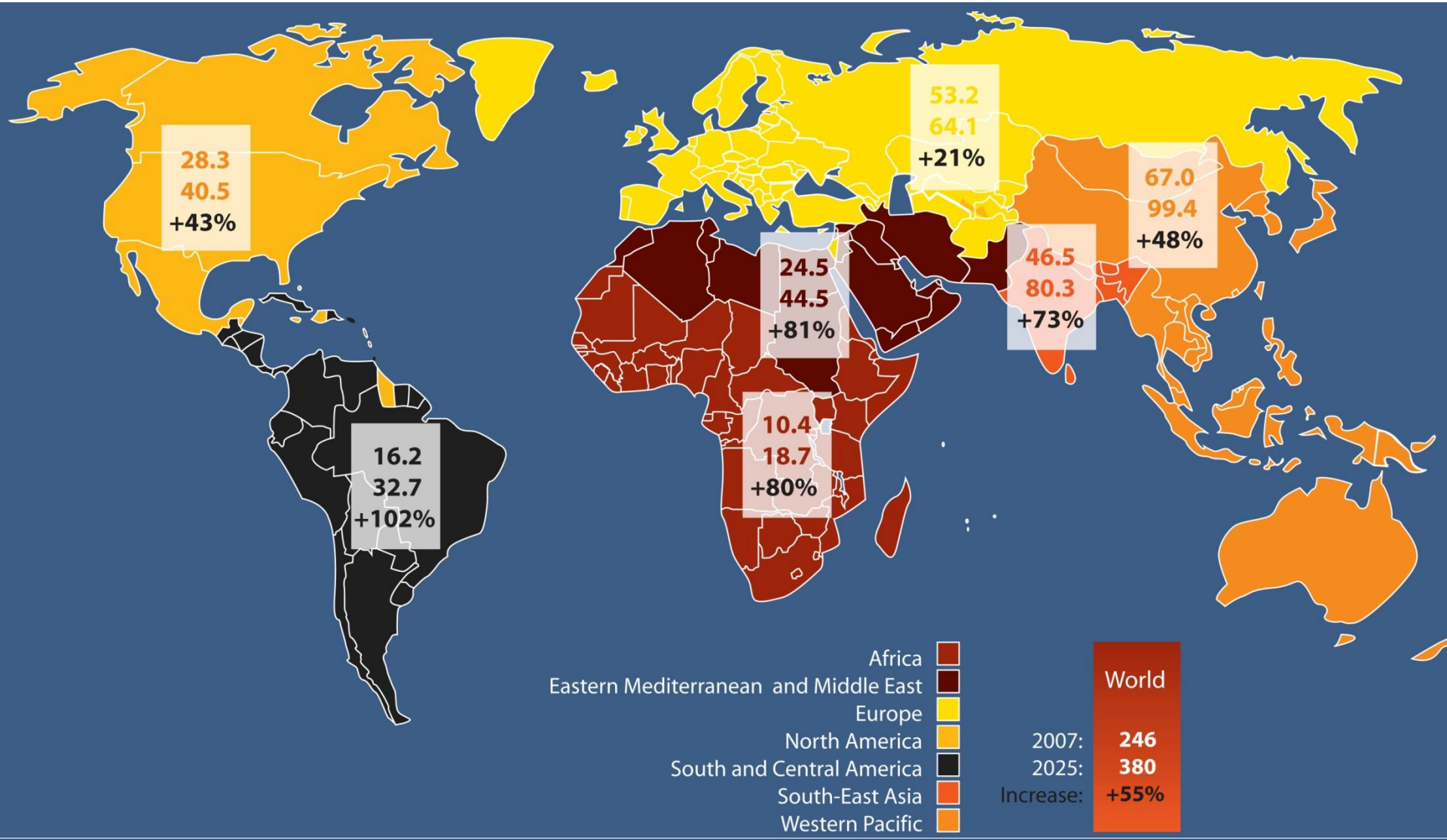

SOURCE: *DIABETES ATLAS* THIRD EDITION © INTERNATIONAL DIABETES FEDERATION, 2006

## PREVALENCE ESTIMATES OF DIABETES, 2025




SOURCE: *DIABETES ATLAS* THIRD EDITION © INTERNATIONAL DIABETES FEDERATION, 2006

# GLOBAL PROJECTIONS FOR THE NUMBER OF PEOPLE WITH DIABETES (20-79 AGE GROUP), 2007 and 2025 (MILLIONS)



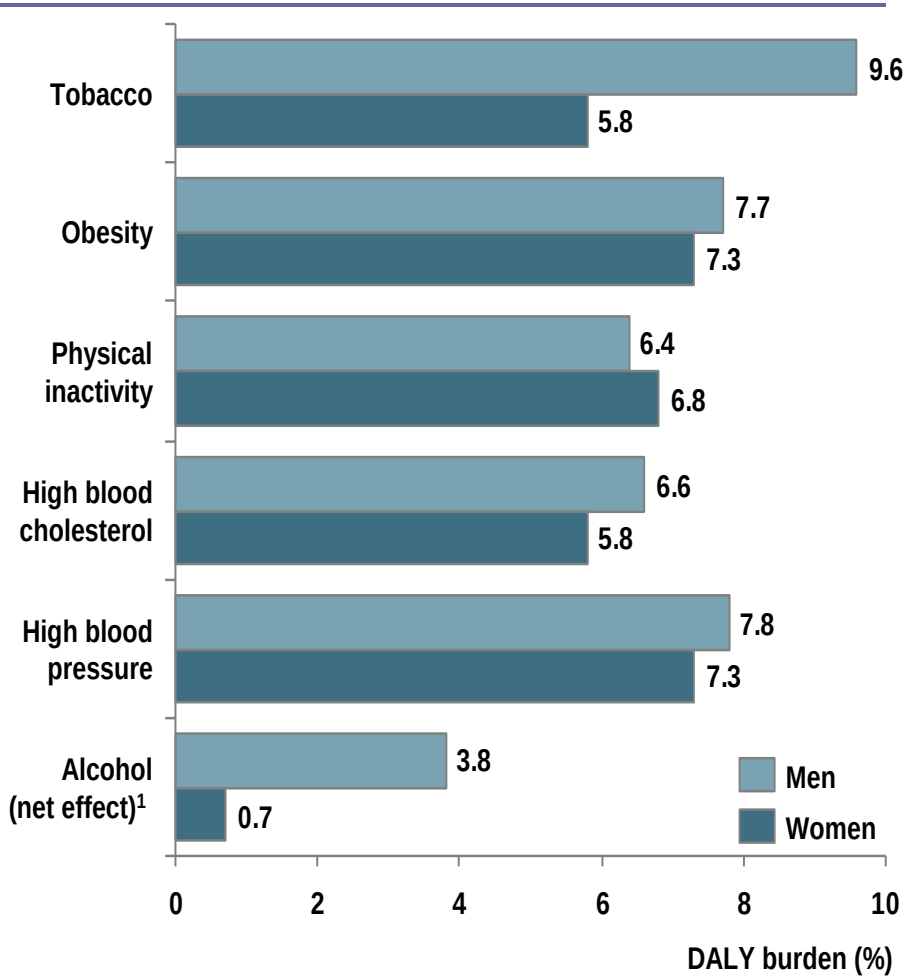

SOURCE: *DIABETES ATLAS* THIRD EDITION © INTERNATIONAL DIABETES FEDERATION, 2006

## …Now and in the future

## Ill-health burden attributable to selected risk factors

**Now in Australia, ~80% of all deaths are attributable to six disease groups**

- **Cancers**
- **Cardiovascular problems**
- **Injuries**
- **Mental Illness**
- **Diabetes**
- **Chronic Respiratory Disease**



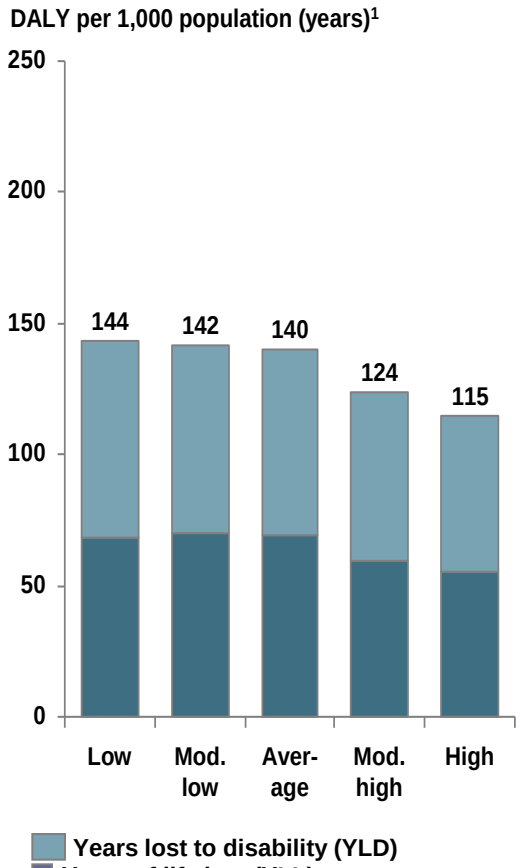

1. Net effect of alcohol, both harmful and beneficial 2. Disease Adjusted Life Years (years lost through death by disease, and years lost to disability by disease). Note that the burden of disease attributed to risk factors does not account for any burden of disease incurred in unborn children, attributable to the lifestyle risk-factors of their mother. For more on this issue (the 'Barker Hypothesis') see *Fetal and infant origins of adult disease* (Barker, 1992) and *The fetal origins of adult disease* (Robinson, 2001)
Source: AIHW, *Burden of Disease and Injury in Australia 2003* (2006)

# Low socio-economic groups

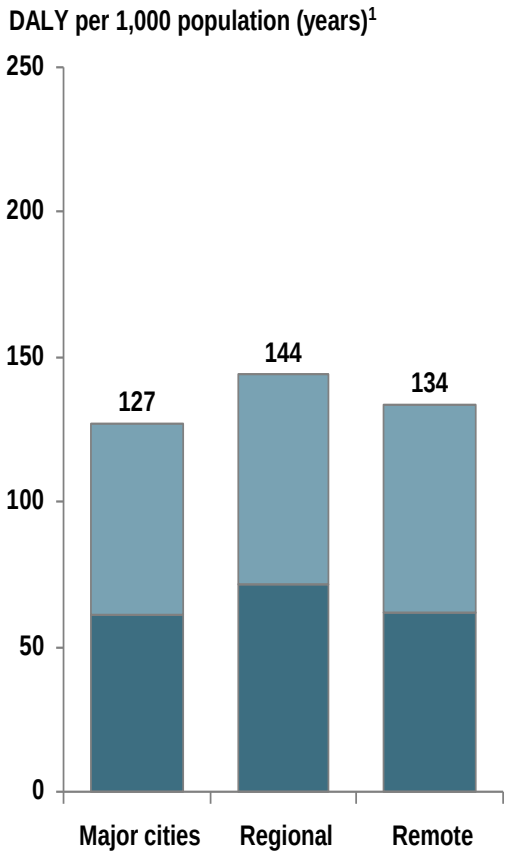
# Rural and regional Australians

# Indigenous Australians

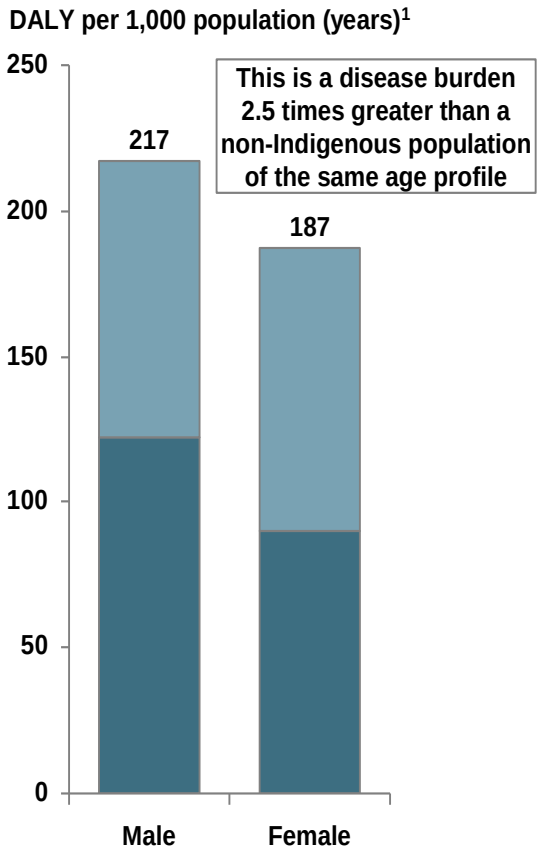
**Burden of disease, by SES quintile – Australia: 2003**




**Burden of disease, by regionality – Australia: 2003**




**Burden of disease, Indigenous Australians by sex: 2003**



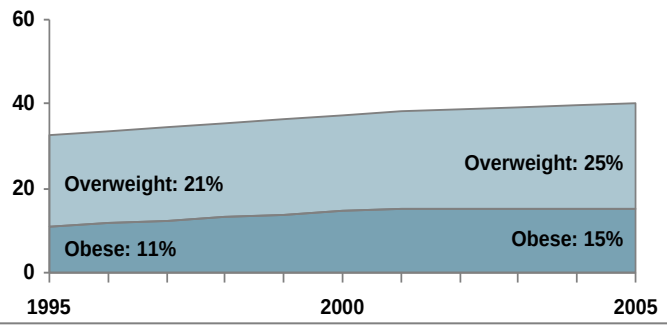

Years lost to disability (YLD)
Years of life lost (YLL)

1. Net effect of alcohol, both harmful and beneficial 2. Disease Adjusted Life Years (years lost through death by disease, and years lost to disability by disease). Note that the burden of disease attributed to risk factors does not account for any burden of disease incurred in unborn children, attributable to the lifestyle risk-factors of their mother. For more on this issue (the 'Barker Hypothesis') see *Fetal and infant origins of adult disease* (Barker, 1992) and *The fetal origins of adult disease* (Robinson, 2001)
Source: AIHW, *Burden of Disease and Injury in Australia 2003* (2006) **Australia 2020 Summit** Long-term Health Strategy April 2008

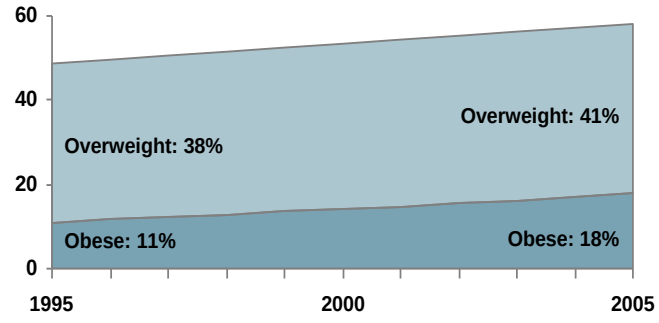
1. Disease Adjusted Life Years (years lost through death by disease, and years lost to disability by disease)
Source: AIHW, *The burden of disease and injury in Australia 2003* (2007); Vos, Barker et al, *Burden of Disease and Injury in Indigenous Australians 2003* (University of Queensland, 2007)

# Obesity and prevalence of chronic diseases

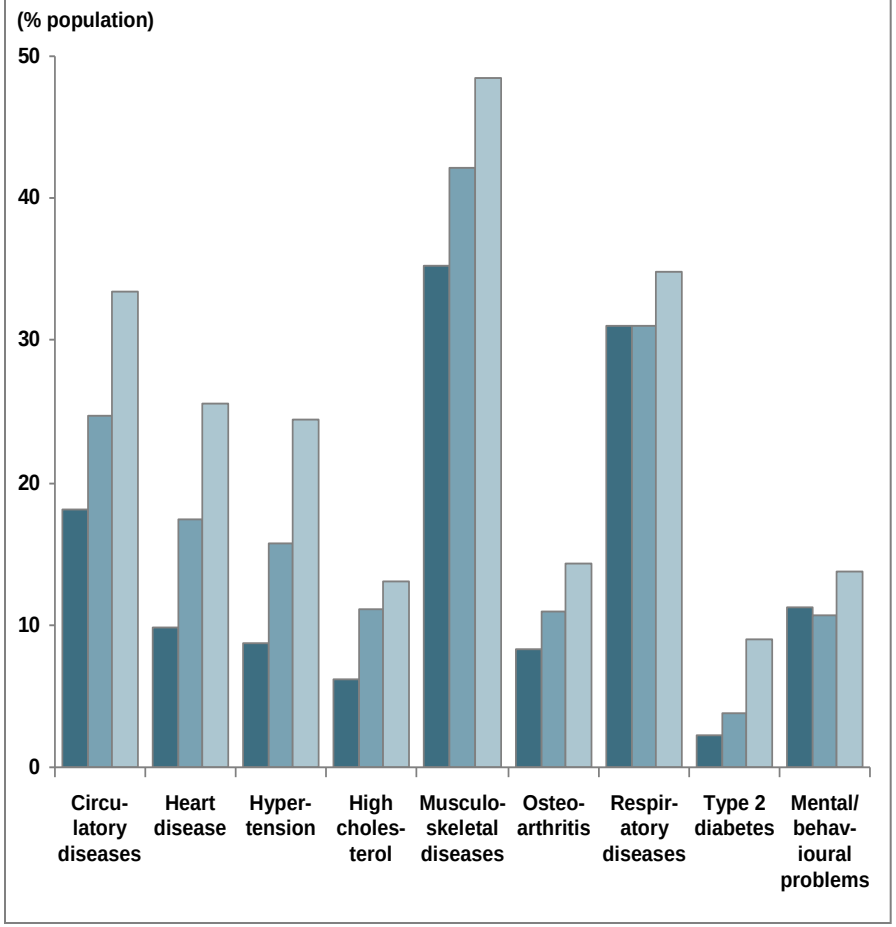
## Women




## Men




## Prevalence of long-term health conditions,[1] by weight class: 2004-5

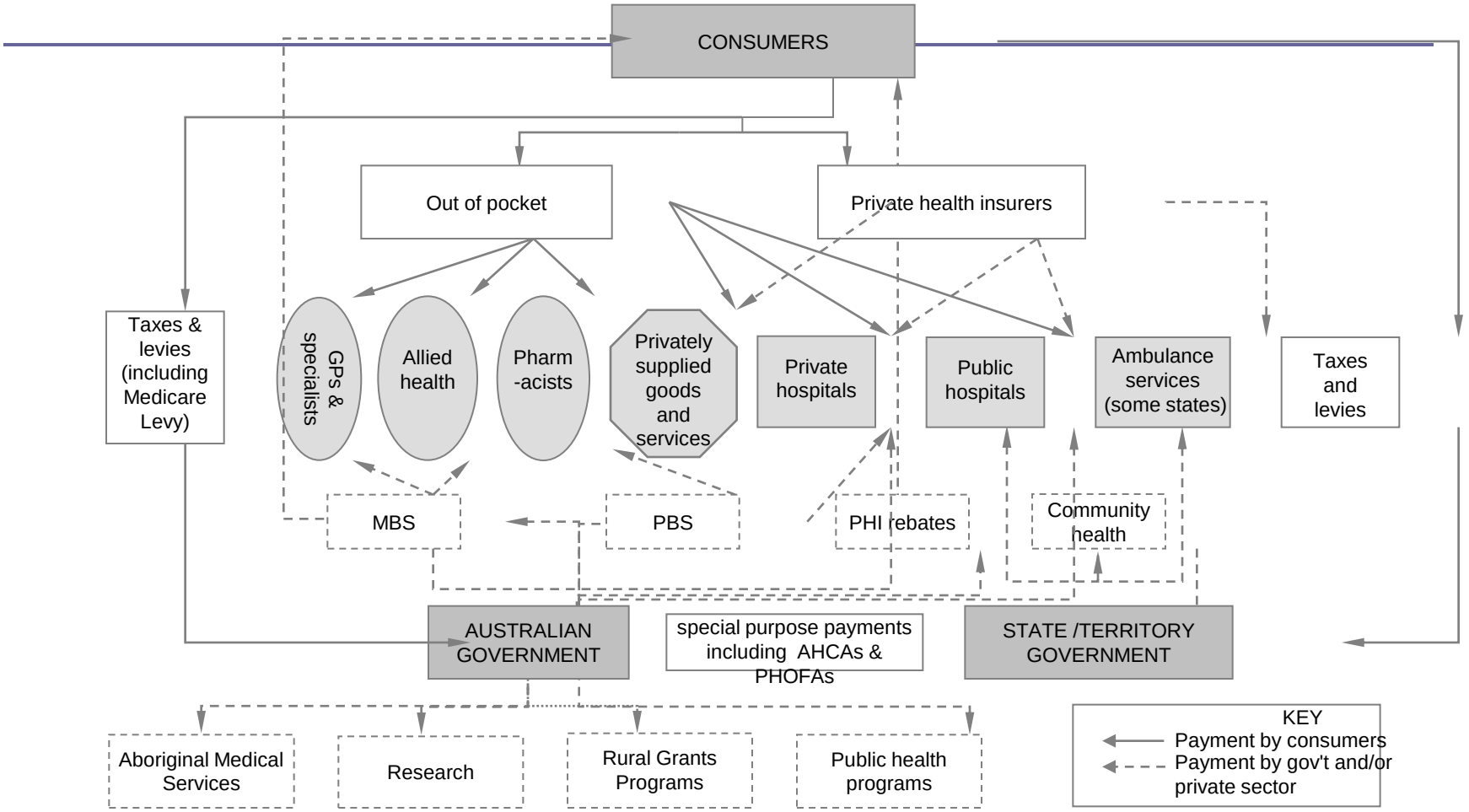



Healthy weight
Overweight
Obese

1. Defined as all conditions with actual or expected duration of 6 months or more (may include, for example, short or long-sightedness)

Source: ABS 4364.0, *National Health Survey: Summary of Results 2004-5* (2006); ABS 4719.0, *Overweight and obesity in Adults, Australia, 2004-5* (2008)

# The Australian health system



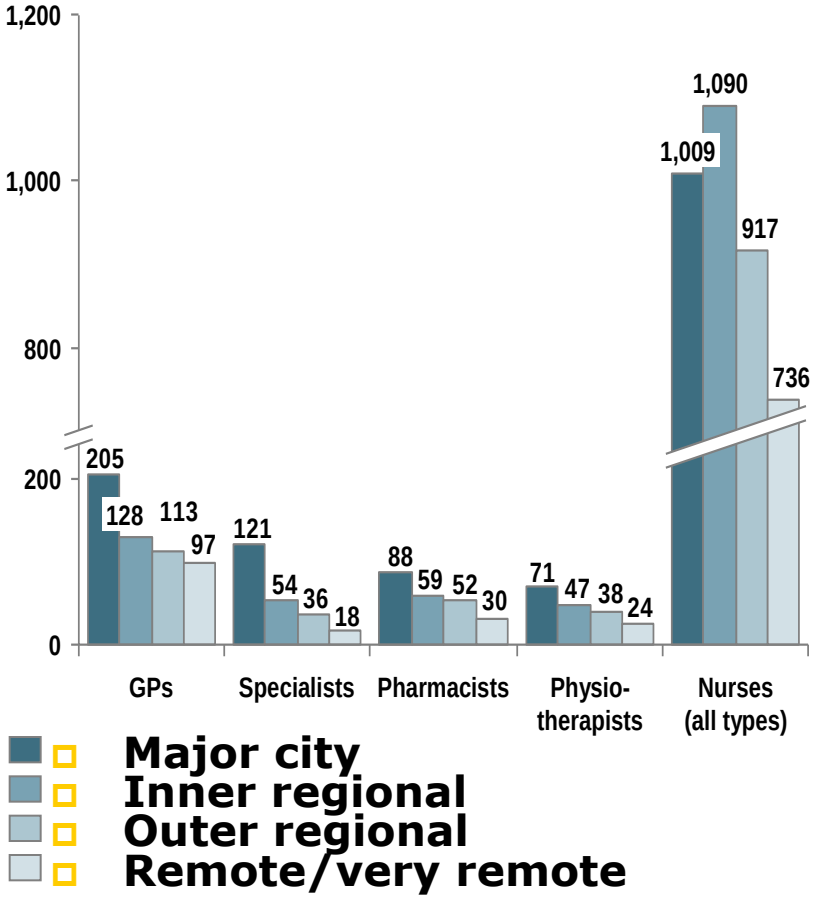

**This gives rise to a mixed model of service provision and accountabilities**

Source: Schematic courtesy of Australian Department of Health and Ageing **Australia 2020 Summit** Long-term Health Strategy April 2008

# Access to health professionals varies widely

# As do the social barriers to health treatment

Health practitioners per 100,000 population, by regionality: 2005-06 (# )[1]



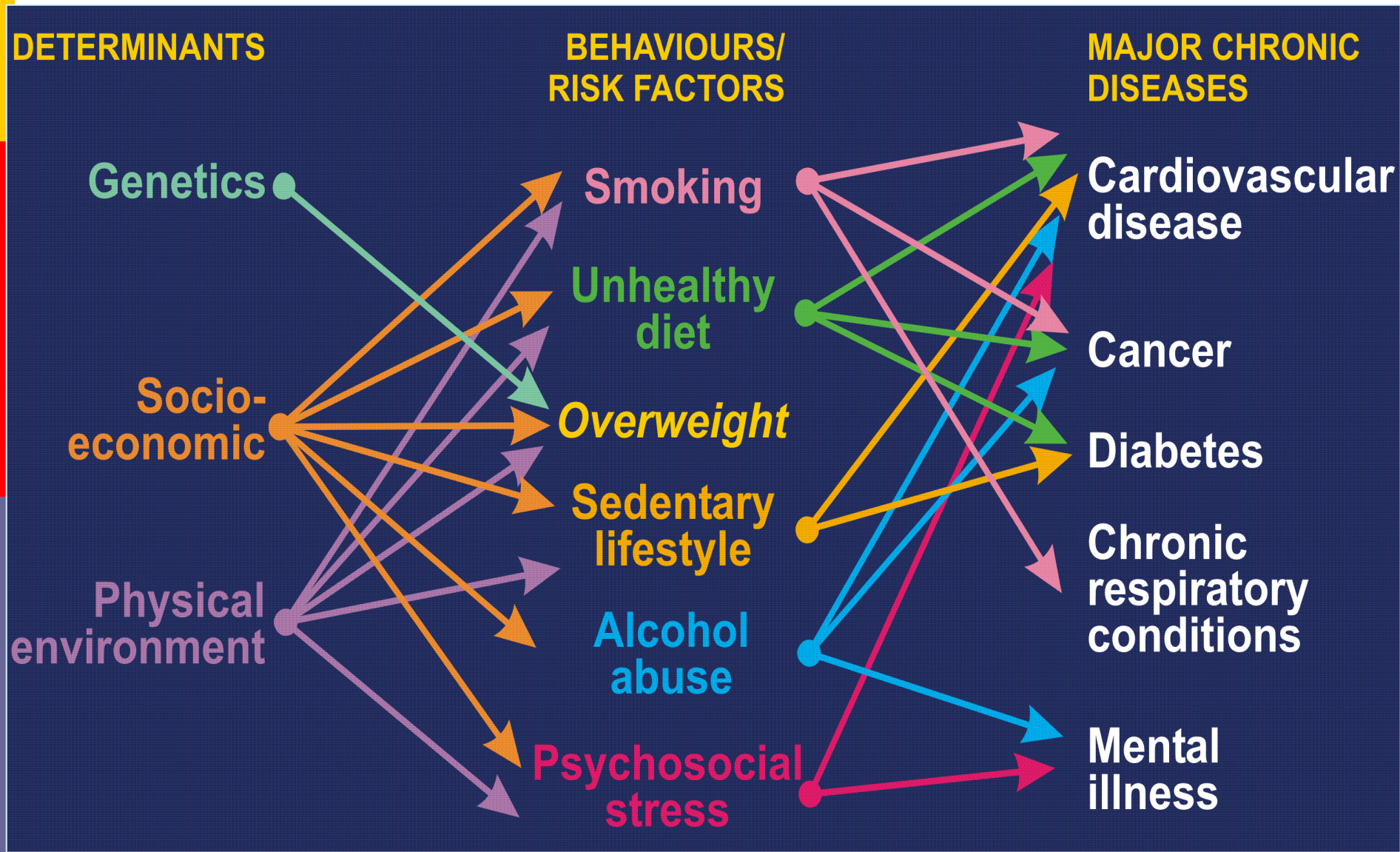

- Private health insurance
- Labour force
- Education
- Language
- Social stigma

1. Based on numbers of people employed, not FTE. 2. As at December quarter 2007 (PHIAC) 3. As at 2004 (ABS)
Source: Most recent data on health practitioners provided by Federal Department of Health and Ageing; figures available on request. Private Health Insurance Administration Council (PHIAC), *Quarterly Statistics, December 2007*; ABS, 1301.0 *Year Book Australia 2006*; ABS, 2068.0 *Census Data 2006*; AIHW, *Male consultations in general practice in Australia 1999-2000* (2003); Klimidis et al, *Mental Health Service Use by Ethnic Communities in Victoria, 1995-6* (VTPU, 1999)

# Health promotion and disease prevention strategies mainly focus on:

- **Single diseases**
- **Single risk factors**
- **Specific population groups**

# Towards a Common Risk Factor Approach



# What works?

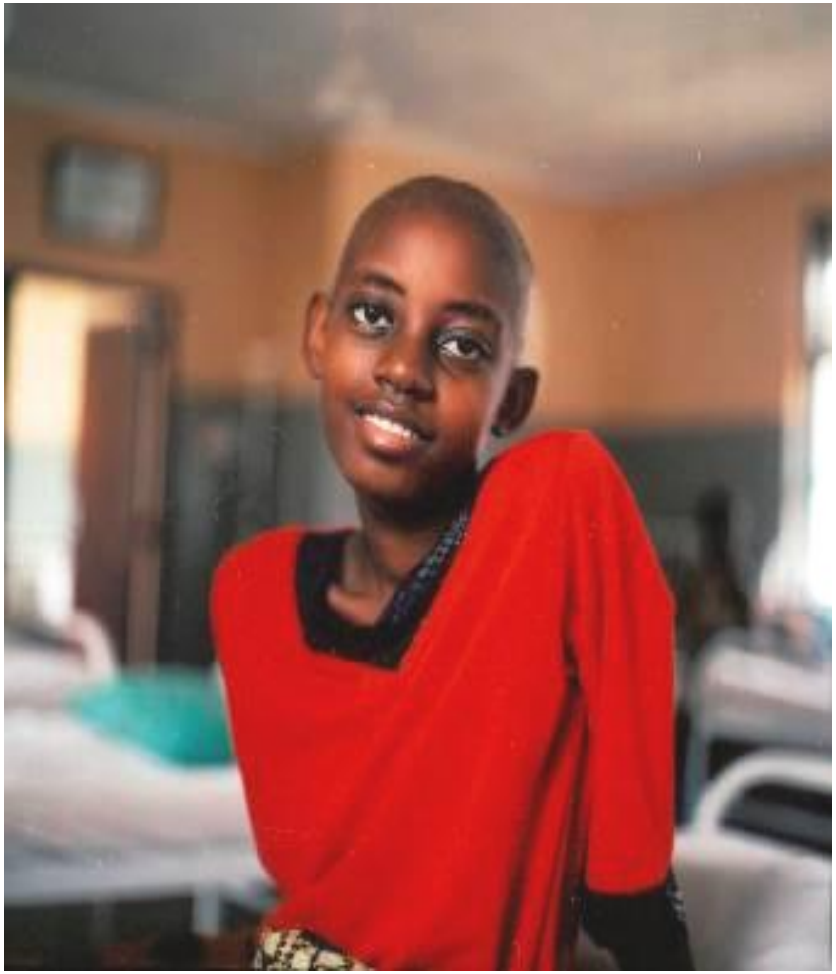

**Comprehensive** and **integrated** action is the means to prevent and control chronic diseases

## Health-related beliefs and behaviours

- Individual
- Educational
- Socio-economic
- Cultural
- Environmental

# Misunderstandings

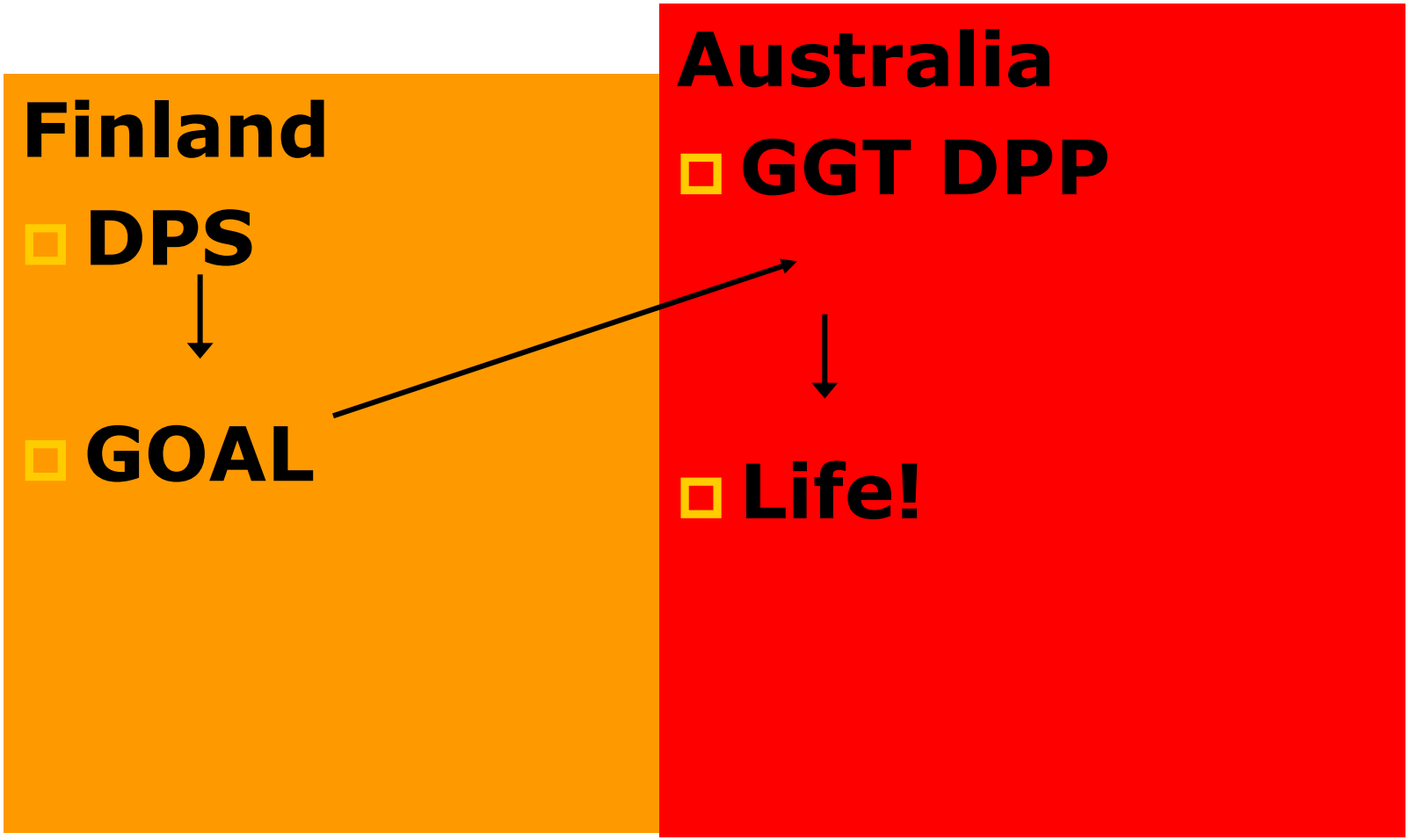
- **Chronic diseases mainly affect old people.**
- **Chronic diseases affect primarily men.**
- **Chronic diseases can’t be prevented.**
- **Chronic disease prevention and control is too expensive.**



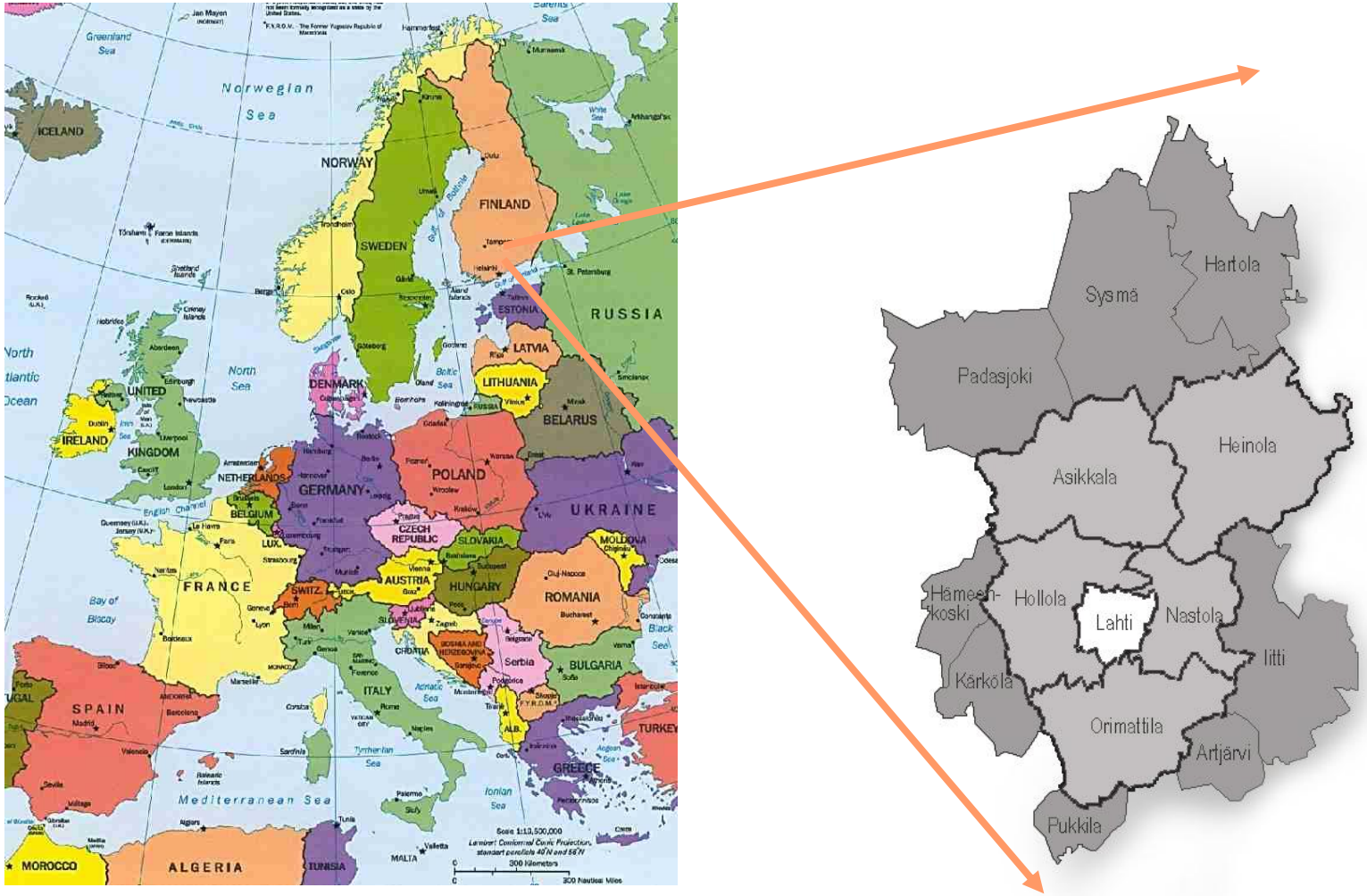
# Half truths

- **My grandfather smoked and was overweight – and he lived to 96.**
- **Everyone has to die of something.**

# RCT to Group Implementation

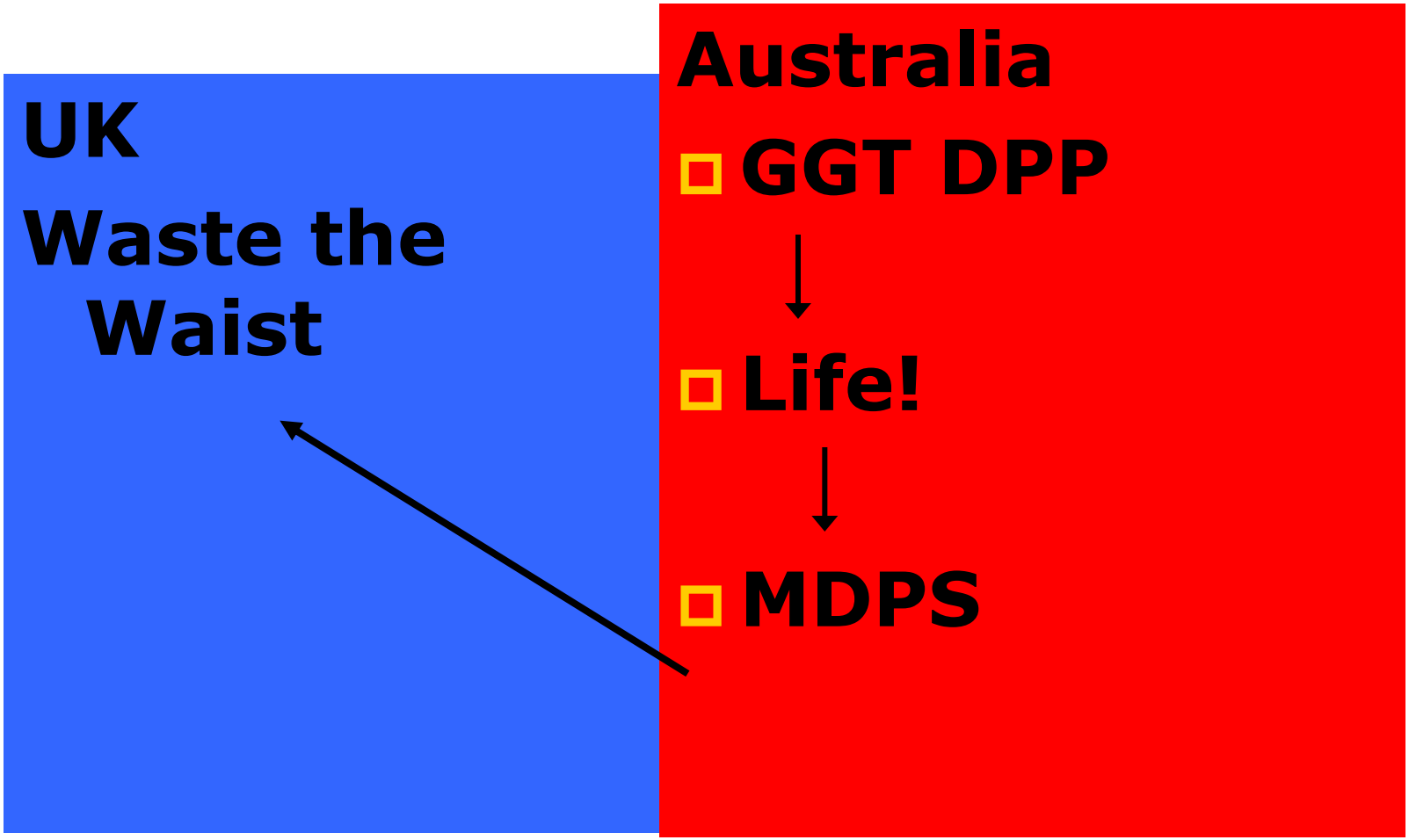


# Finland and the GOAL Program demonstration area Päijät-Häme Province

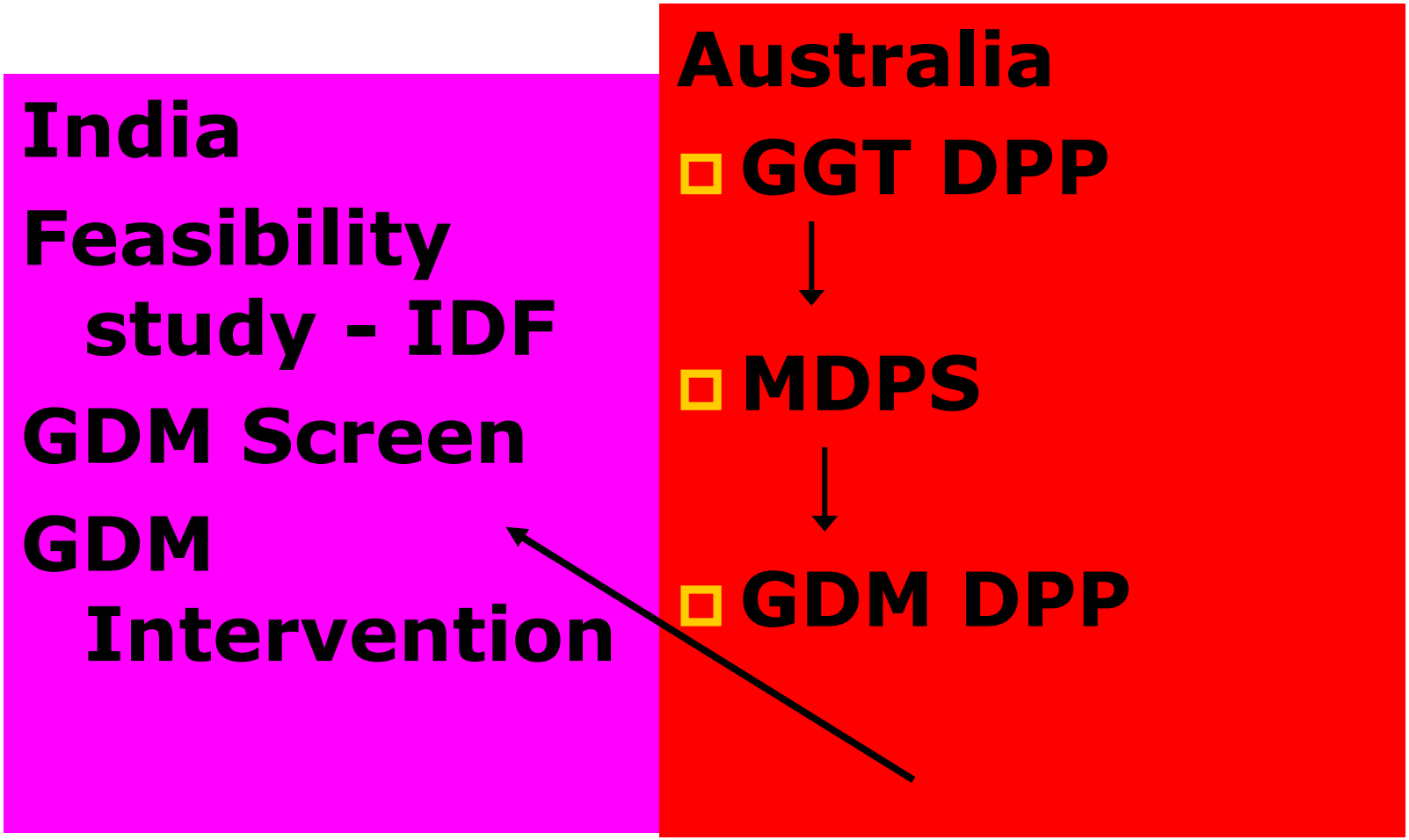



Australia
NT
QLD
WA
SA
NSW
ACT
TAS
Victoria
S.A.
VICTORIA
Horsham
Naracoorte
Stawell
Penola
Ararat
BALLARAT
Millicent
Casterton
MT GAMBIER
Hamilton
MELBOURNE
Camperdown
GEELONG
Portland
Warrnambool
Terang
Colac
Apollo Bay

# Evaluation & Adaptation



# Evaluation & Adaptation

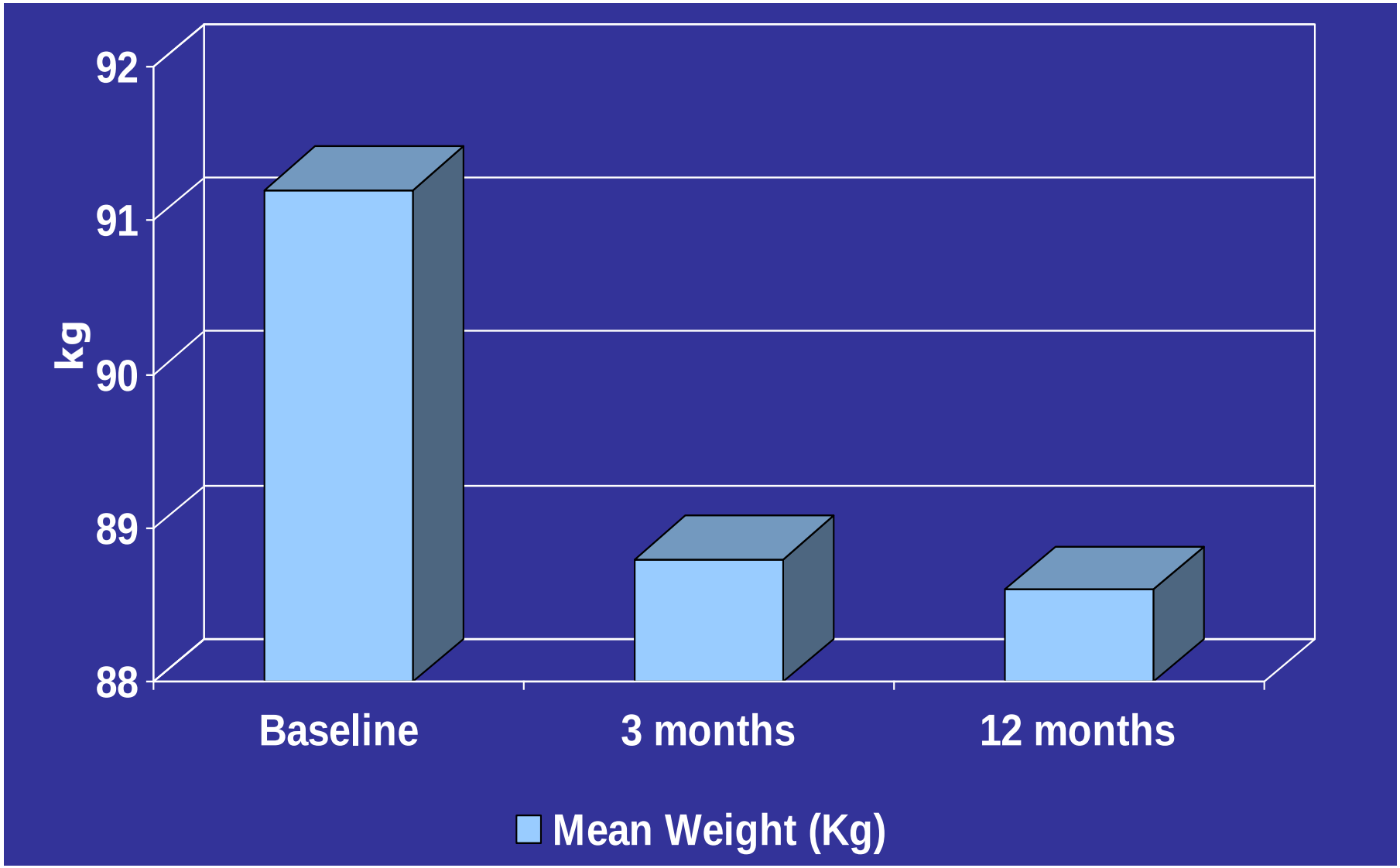


# Modifiable risk factors

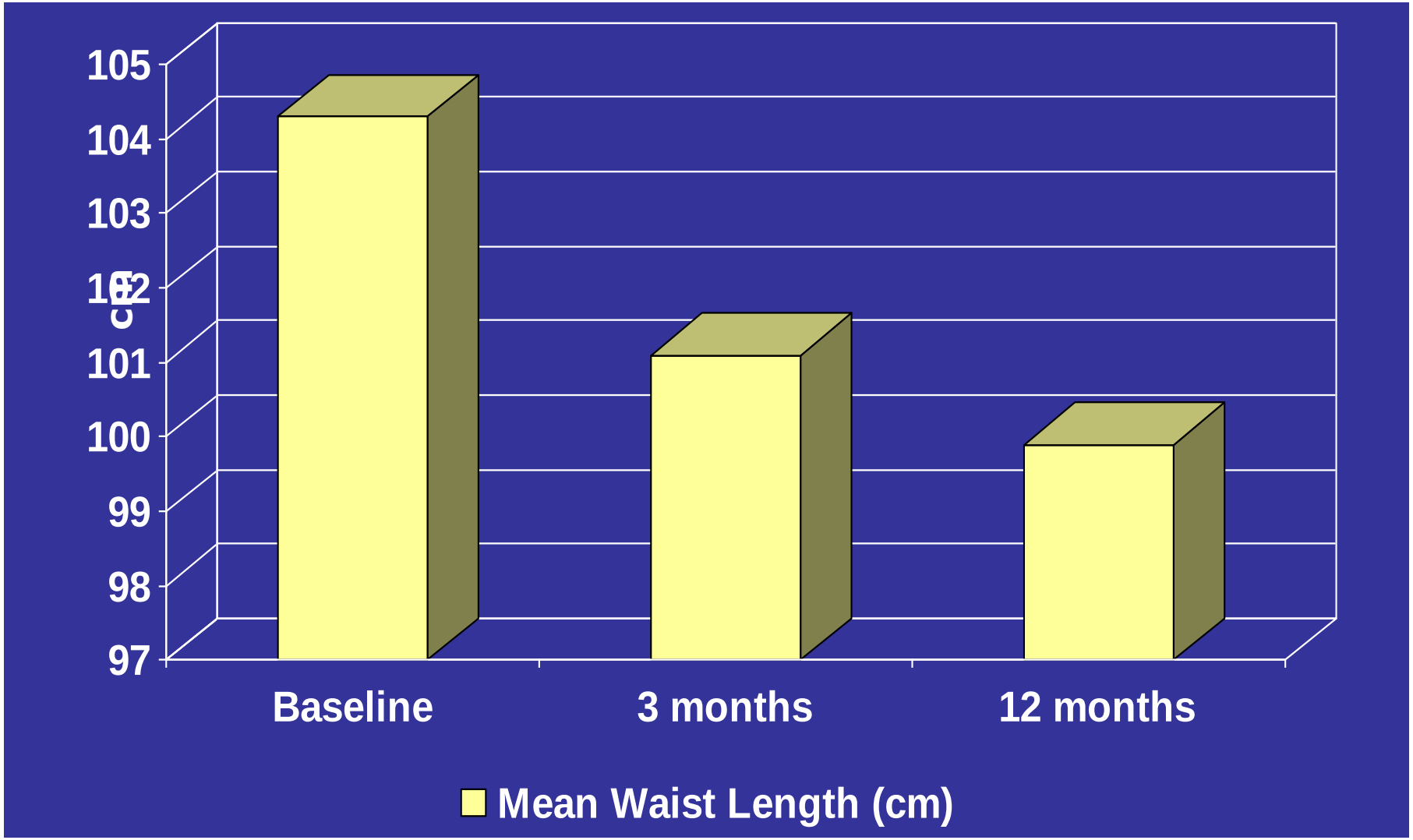
**Targets for lifestyle modification programs**

- Overweight (BMI $\geq$ 25 kg/m$^2$)
- Obesity central and total
- Sedentary lifestyle
- Dietary factors
- Hypertension
- Decreased HDL cholesterol
- Our program was the first diabetes prevention program to include depression and anxiety

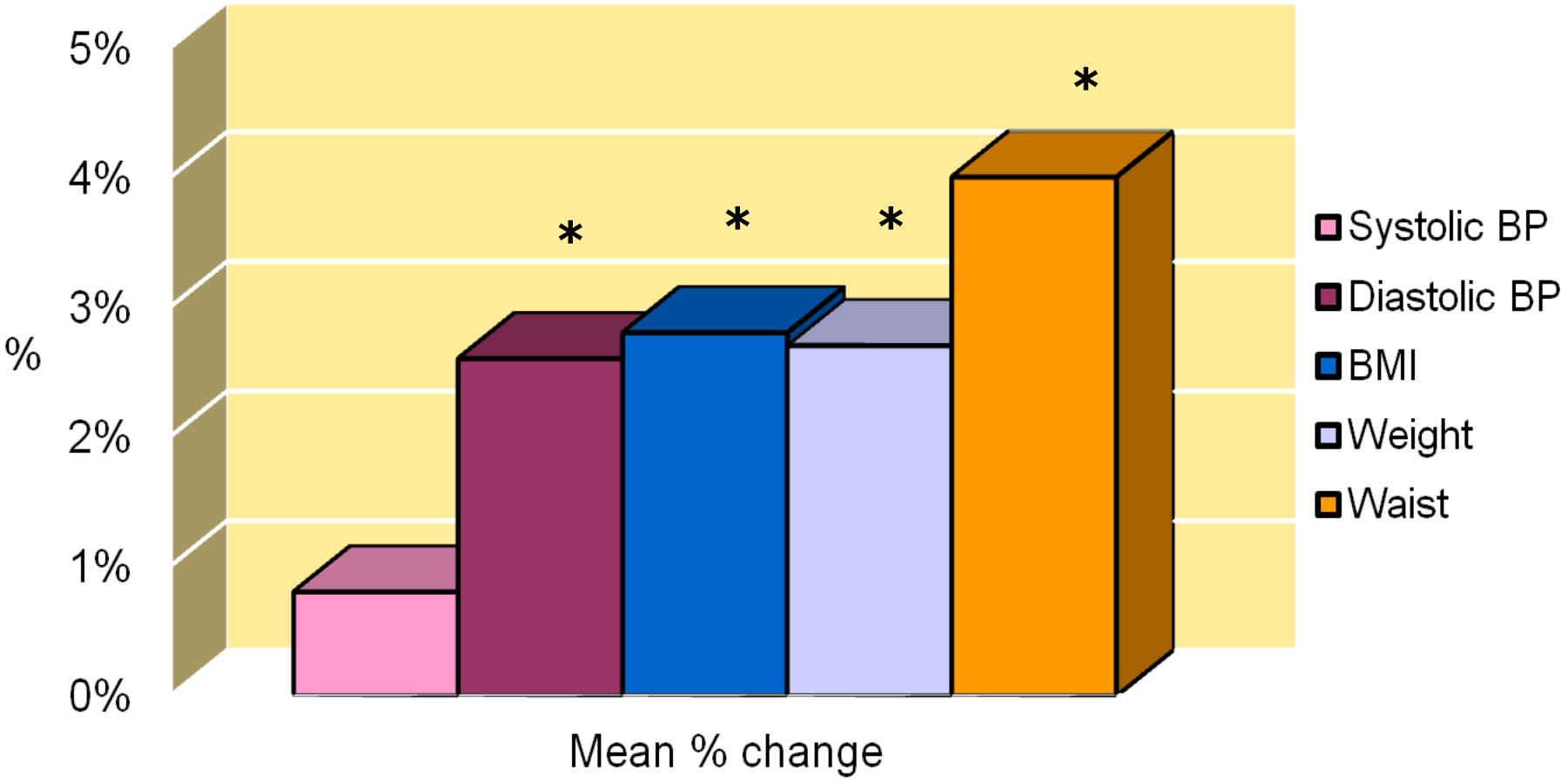
# Mean Weight over 12 months



# Mean Waist over 12 months

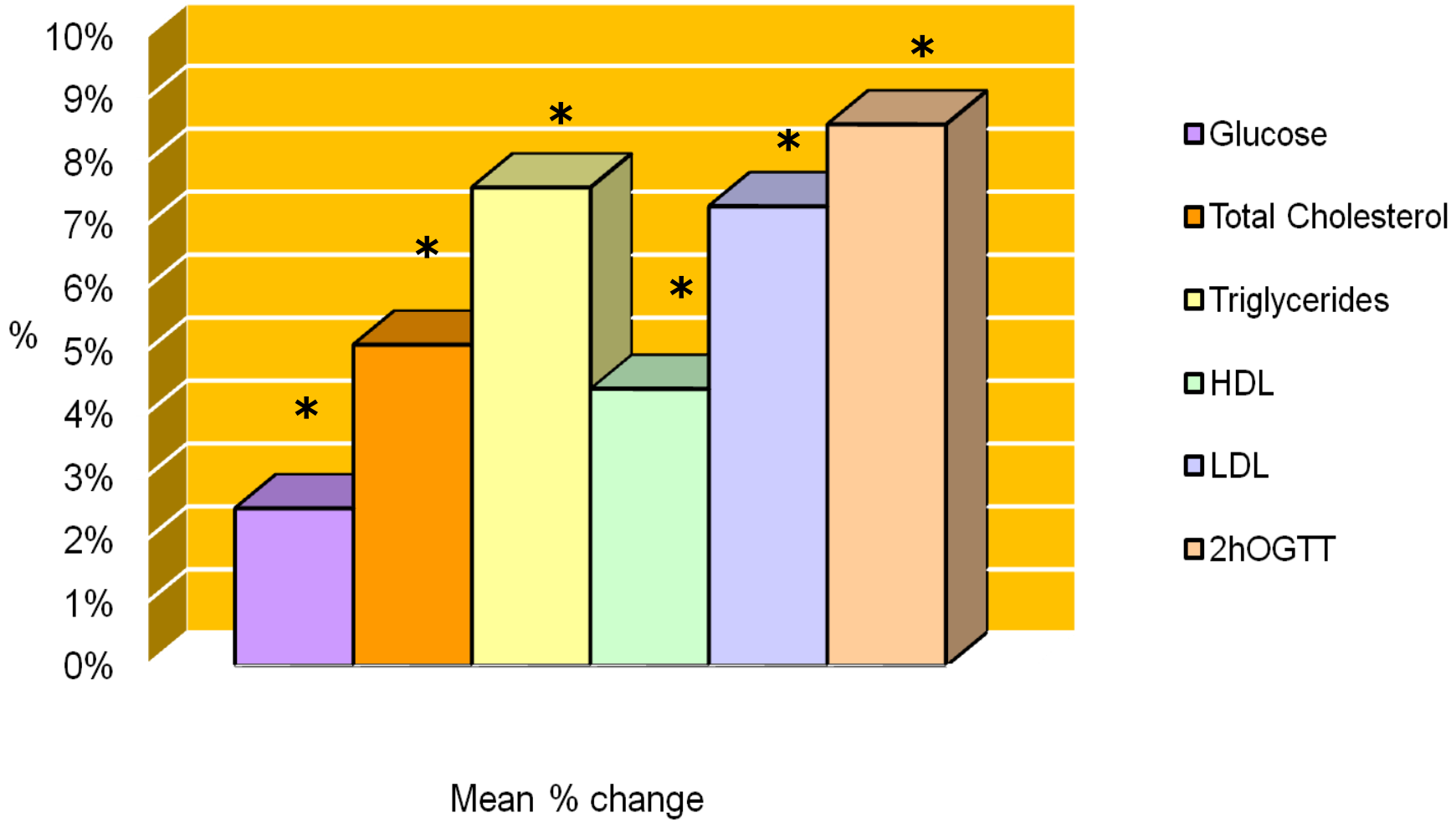


# Improvement (%) in anthropometric measurements baseline and 12 months




* p value for the difference <0.01

# Improvement (%) in lipid and glucose measurements baseline and 12 months




* p value for the difference <0.01

# Completers & Non-completers

- 311 started intervention
- 237 (76%) completed intervention
- At baseline non-completers had

- higher waist circumference
- lower levels of education
- higher scores on measures of psychological distress, anxiety and depression

Life!
Taking Action on Diabetes

# TYPE2
DIABETES RISK TEST

**Circle one answer for each question and add up your points:**

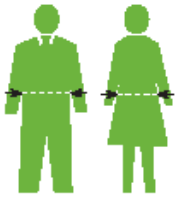
**1 Your age**

| | |
|---|---|
| Under 45 years | 0 points |
| 45–54 years | 2 points |
| 55–64 years | 3 points |
| Over 64 years | 4 points |

**2 Your body mass index** (See reverse of form)

| | |
|---|---|
| Lower than 25 kg/m² | 0 points |
| 25–30 kg/m² | 1 point |
| Higher than 30 kg/m² | 3 points |

**3 Your waist measurement taken below the ribs (usually at the level of the navel)**



The test has not been validated in Aboriginal and Torres Strait Islander people and culturally and linguistically diverse groups.

| Men | Women | |
|---|---|---|
| Less than 94cm | Less than 80cm | 0 points |
| 94cm – 102cm | 80cm – 88cm | 3 points |
| More than 102cm | More than 88cm | 4 points |

**4 On average, would you say you did at least 30 minutes of physical activity per day, either at work, at home, or during leisure time?**

| | |
|---|---|
| Yes | 0 points |
| No | 2 points |

**5 How often do you eat vegetables or fruit?**

| | |
|---|---|
| Every day | 0 points |
| Not every day | 1 point |

**6 Have you ever taken medication for high blood pressure on a regular basis?**

| | |
|---|---|
| No | 0 points |
| Yes | 2 points |

**7 Have you ever been found to have high blood glucose (eg in a health examination, during an illness, during pregnancy)?**

| | |
|---|---|
| No | 0 points |
| Yes | 5 points |

**8 Have any of the members of your immediate family or other relatives been diagnosed with diabetes (type 1 or type 2)?**
(maximum of 5 points)

| | |
|---|---|
| No | 0 points |
| Yes: *Grandparent, aunt, uncle, or first cousin (but not own parent, brother, sister or child)* | 3 points |
| Yes: *Parent, brother, sister or own child* | 5 points |

**Total Risk Score:**

**Your risk of developing type 2 diabetes within ten years is:**

**Less than 7: Low risk – continue to maintain your healthy lifestyle**
Approximately one in every 100 will develop diabetes.

**7–14: Intermediate risk – talk to your doctor about preventing diabetes**
For scores of 7–11 approximately one person in every 25 develops diabetes and for scores of 12–14 approximately one person in every six develops diabetes.

**15 or more: High risk – make an appointment today to see your doctor**
For scores of 15–20 approximately one person in every three develops diabetes and for scores of more than 20 approximately one person in every two develops diabetes.

PLEASE TURN OVER

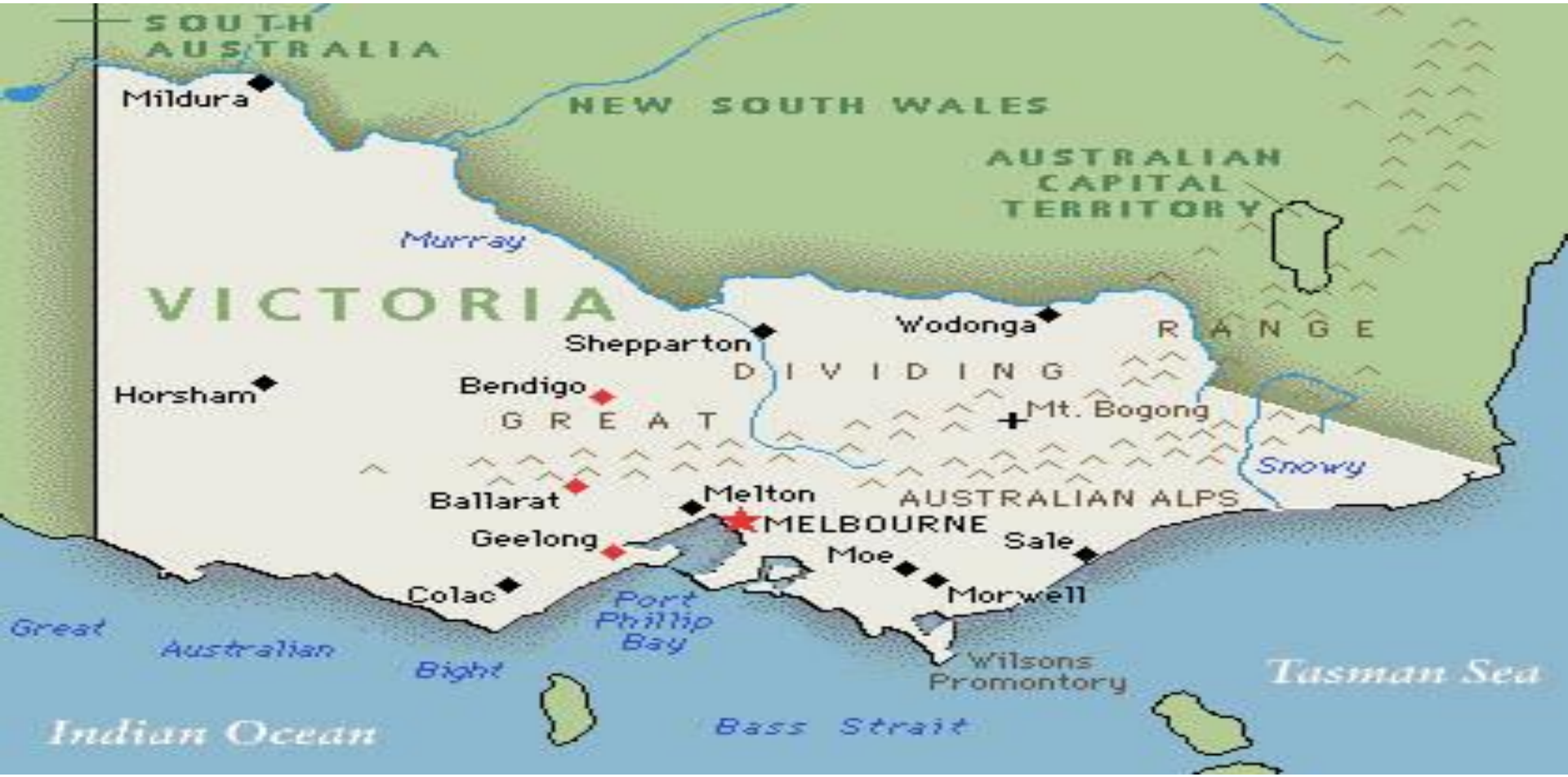
Test based on design by Professor Jaakko Tuomilehto, Department of Public Health, University of Helsinki, and Jaana Lindström, MFS, National Public Health Institute, Finland, 2001.

diabetes australiavic

# Life! Public health intervention

- **Target: people over the age of 50 years at high risk of diabetes**
- **Goal: prevention of diabetes in this high risk group**

# Statewide Diabetes Prevention Program




**Victoria: population 5 million, 70% in Melbourne. Victorians come from over 200 countries, speak over 180 languages, follow 110 different faiths; 44% born overseas.**

# Gender patterns

**Women (n=1427) 63%**

- Age av 63.79 years
- >High School **29.2**%
- Low income **66.2**%
- Smoking 5.9%

- Risk score **19.3**
- **Existing CVD 16.7%**
- BMI **33.2** kg/m2

- >mod depression 6.9%
- >mod anxiety **20.8**%

**Men (n=839)**

- Age av 64.48 years
- >High School **34.7**%
- Low income **56.6**%
- Smoking 7.4%

- Risk score **20.4**
- **Existing CVD 26.1%**
- BMI **31.3** kg/m2

- >mod depression 5.0%
- >mod anxiety **13.6**%

**Figures in bold p<.01**

# Who completes Life! programs?

**Drop out (n=444) 20%**

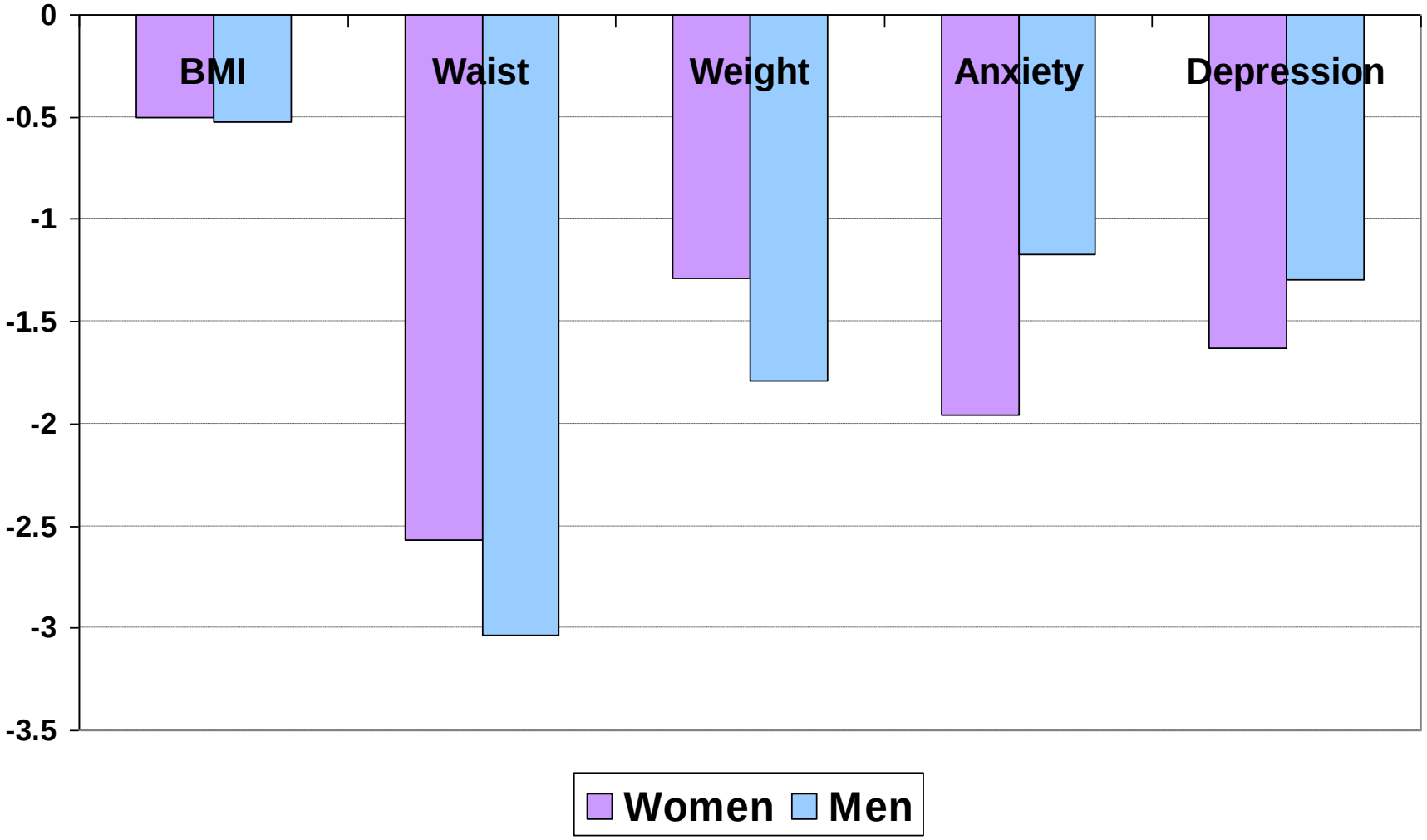
- Women 64.2%
- Men 35.8%
- Age av **63.03** years
- >High School 28.3%
- Low income 67.3%
- Risk score 19.59 base
- Smoking **9.7%**
- Existing CVD 19.8%
- BMI **33.4** kg/m2
- Weight **91.29** kg
- Waist **107.96** cm
- >mod depression 4.8%
- >mod anxiety 19.8%

**Complete (n=1753) 80%**

- Women 62.8%
- Men 37.2%
- Age av years
- >High School 31.9%
- Low income 62.2%
- Risk score 19.72 base
- Smoking **5.9%**
- Existing CVD 20.3%
- BMI **32.2** kg/m2
- Weight **88.51** kg
- Waist **105.46** cm
- >mod depression 4.7%
- >mod anxiety 17.4%

**Figures in bold p<.001**

# Pre-post mean change x Gender



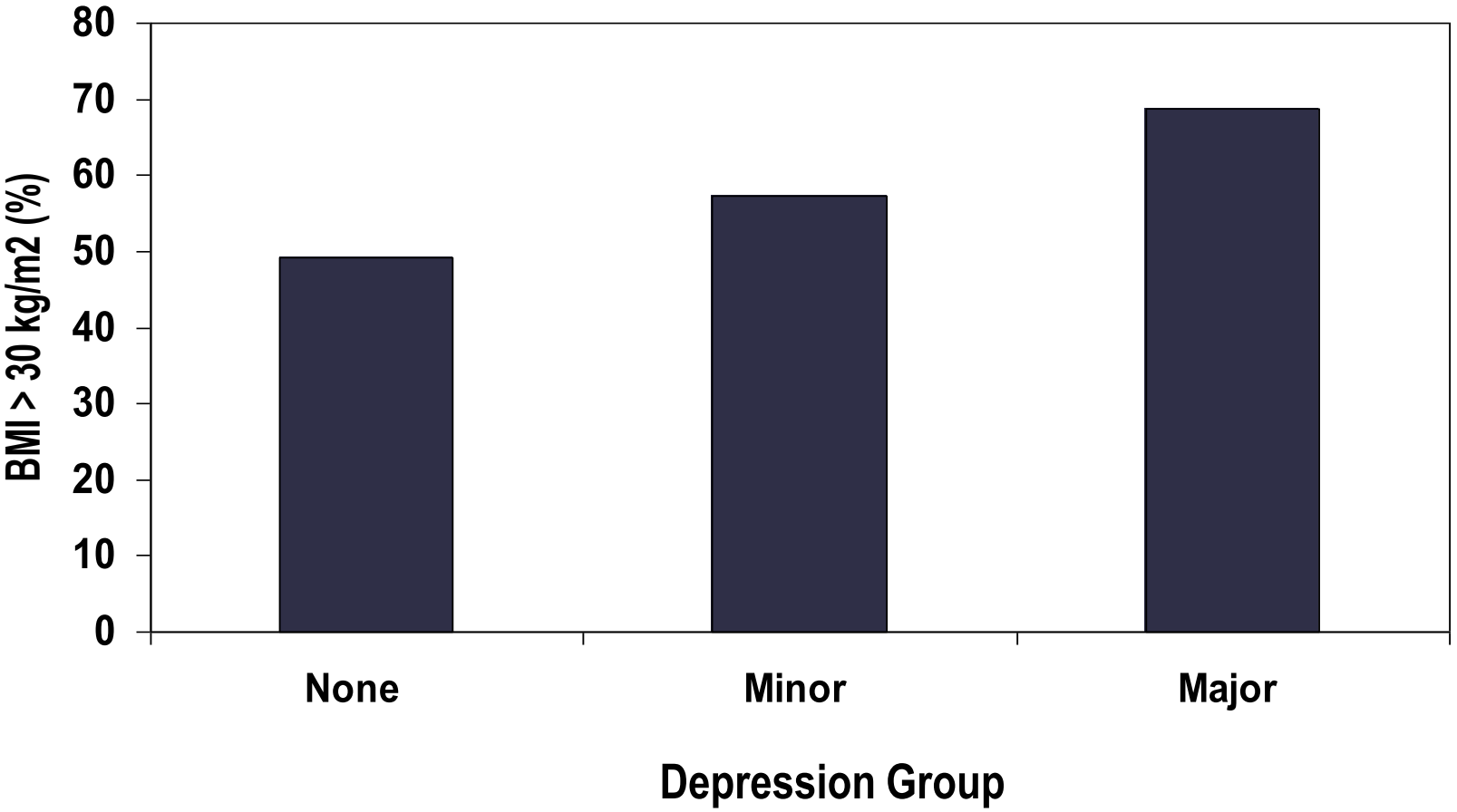

**Figures in bold p<.001**

Δ anx no r Δ BMI, waist, weight

**Δ dep r Δ BMI & weight for women (<.01)**

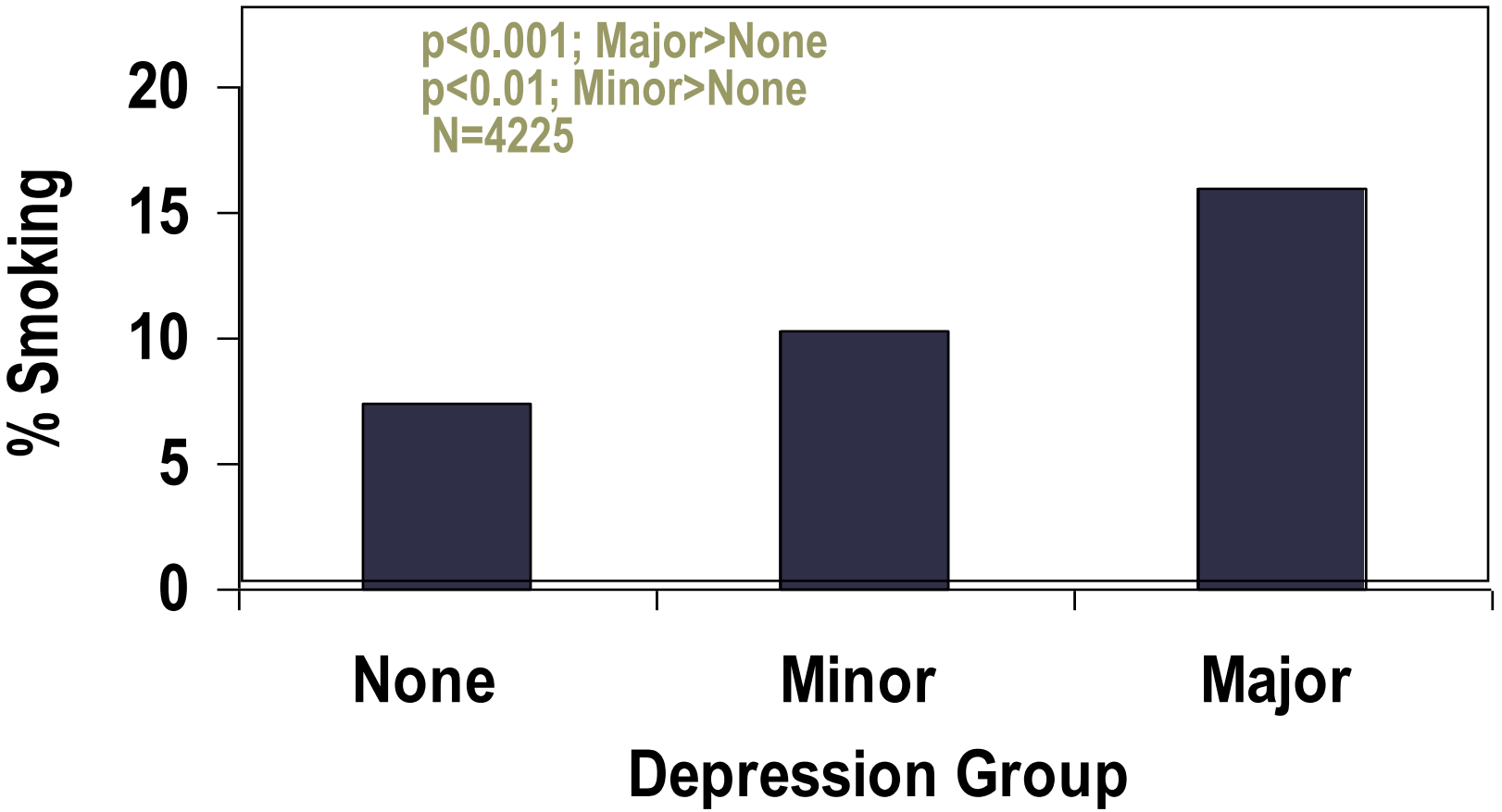
# Depression is associated with an increased BMI >30 kg/m2

p<.001; Major>None
p<.01; Minor>None
N=4225



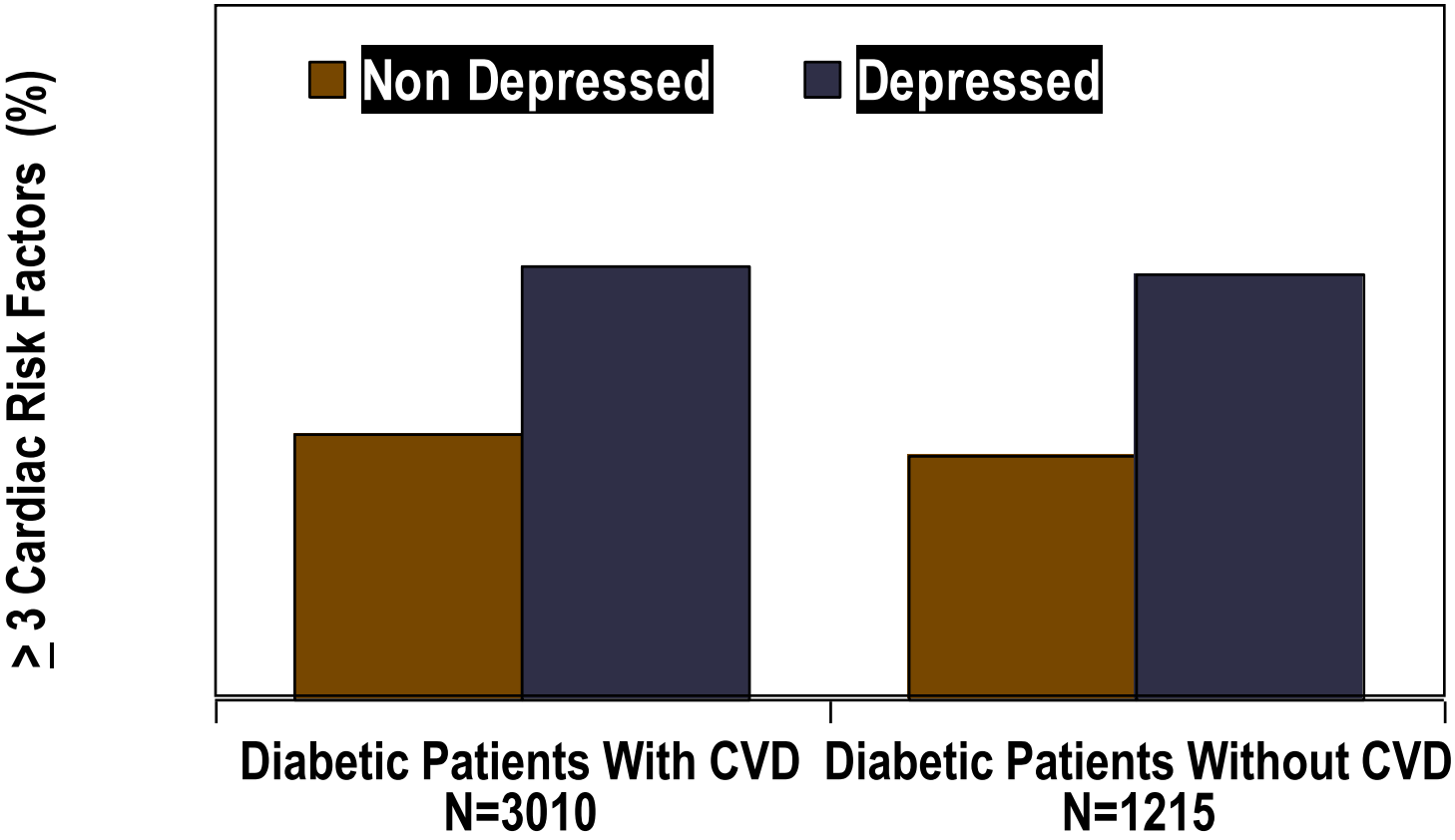

Adjusted for demographics, medical comorbidity, diabetes severity, diabetes type and duration, treatment type, HbA1c and clinic Katon et al, *Diabetes Care*, 2004

# Depression is associated with an increased percent of smoking




Adjusted for demographics, medical comorbidity, diabetes severity,diabetes type and duration, treatment type, HbA1c and clinic. Katon et al, Diabetes Care, 2004

# Depression is associated with a higher number of cardiac risk factors



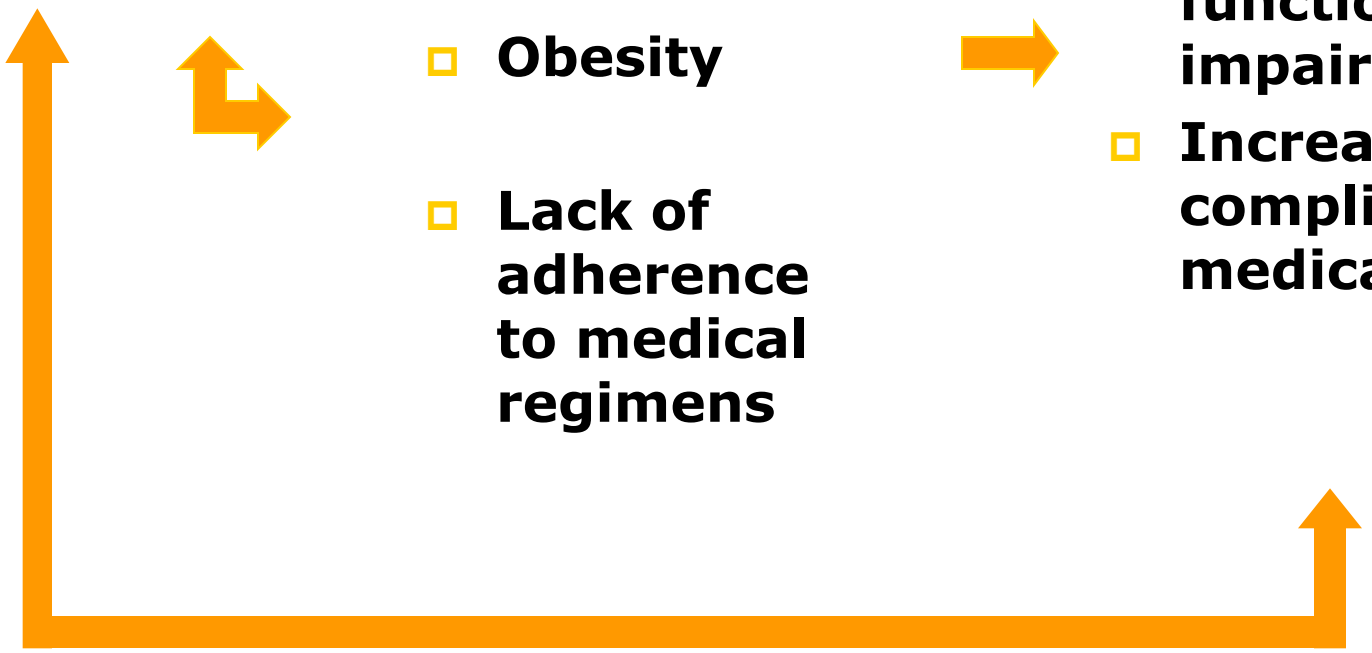

Katon et al, *J Gen Intern Med*, 2004

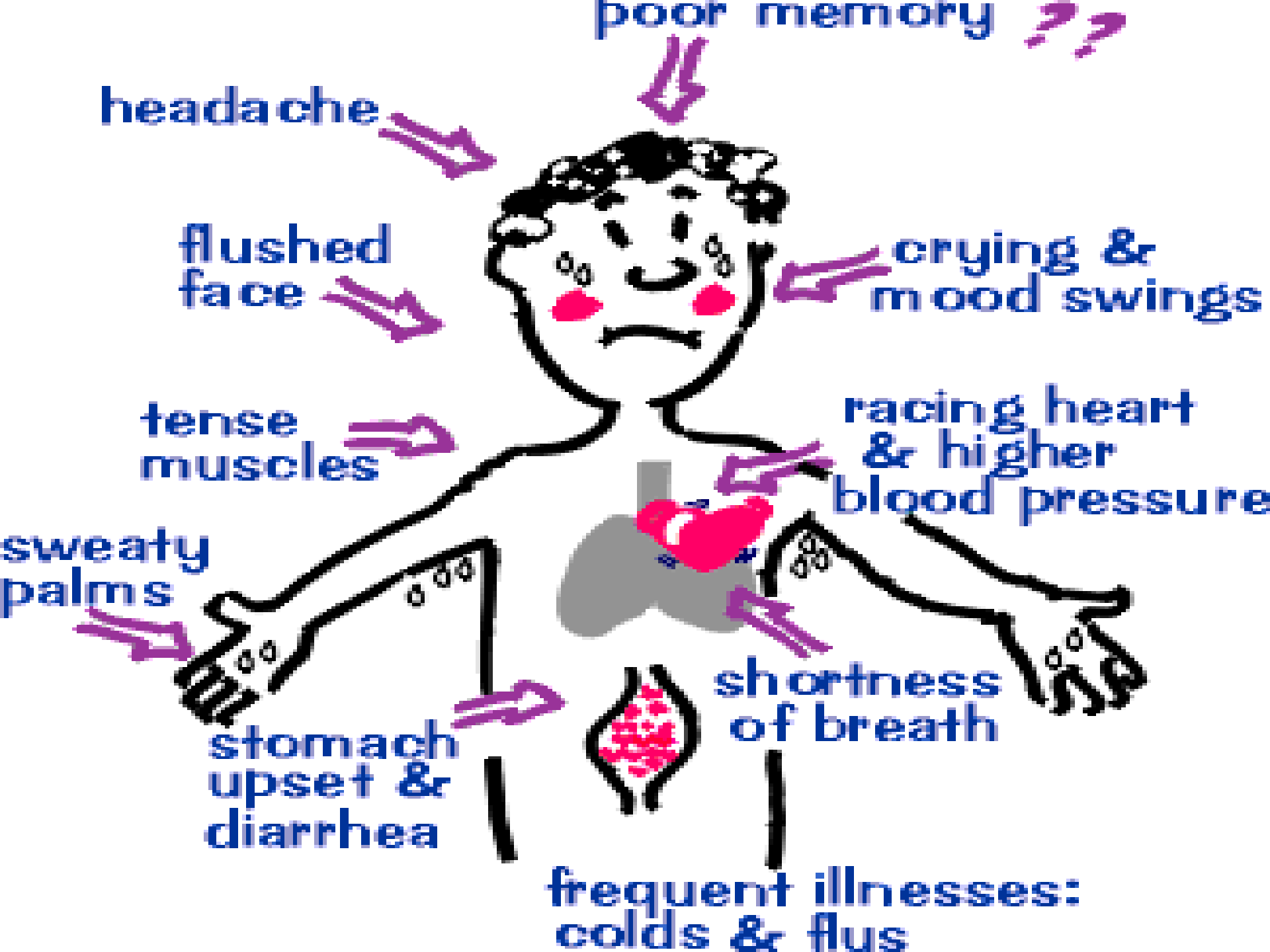
# Interactive pathways

**Major Depression**

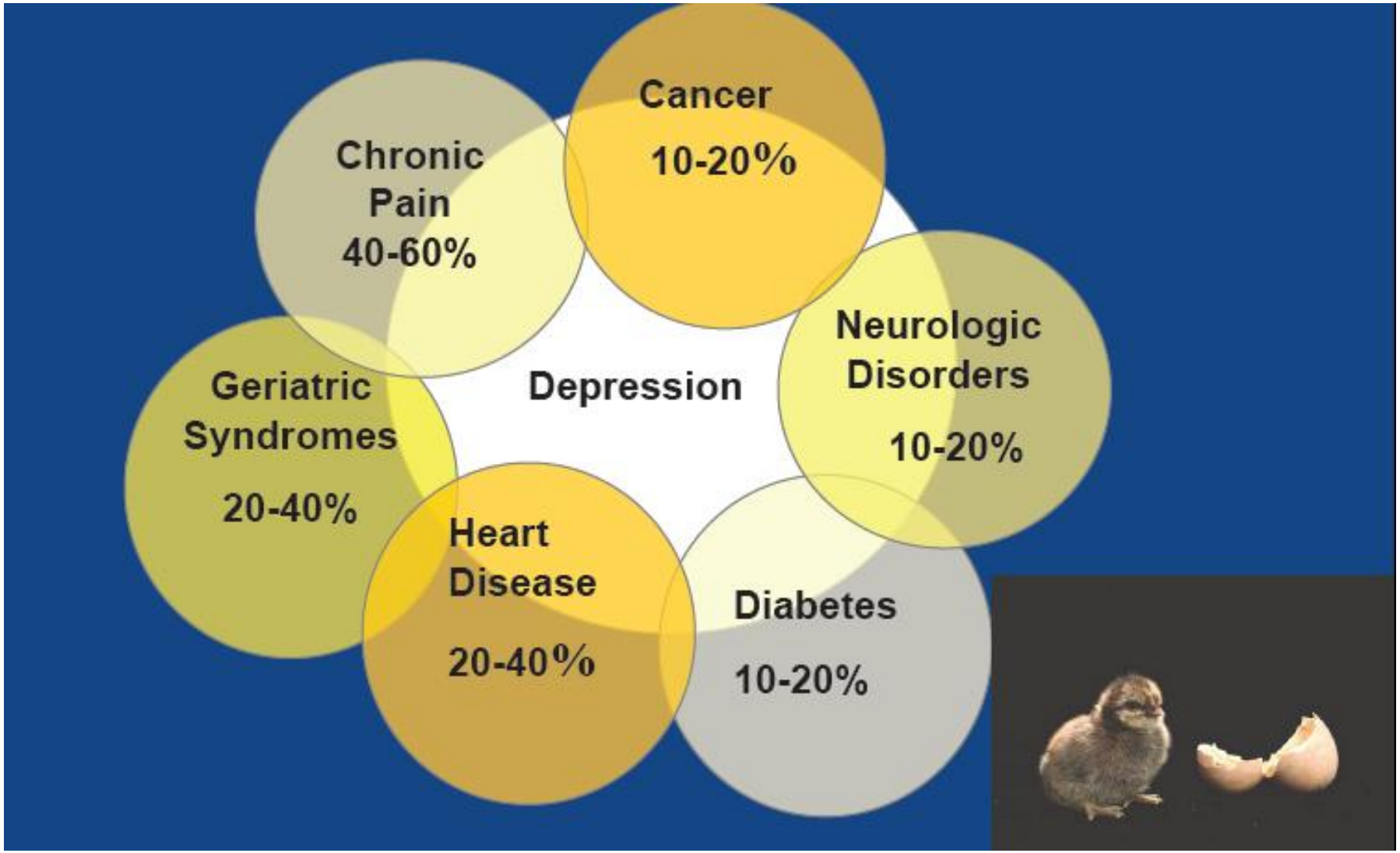
- **Smoking**
- **Sedentary lifestyle**
- **Obesity**
- **Lack of adherence to medical regimens**

- **Medical illness at earlier age**
- **Poor symptom control**
- **Increased functional impairment**
- **Increased complications of medical illness**




poor memory
headache
flushed face
crying & mood swings
tense muscles
racing heart & higher blood pressure
sweaty palms
shortness of breath
stomach upset & diarrhea
frequent illnesses: colds & flus

# Depression in chronic disease

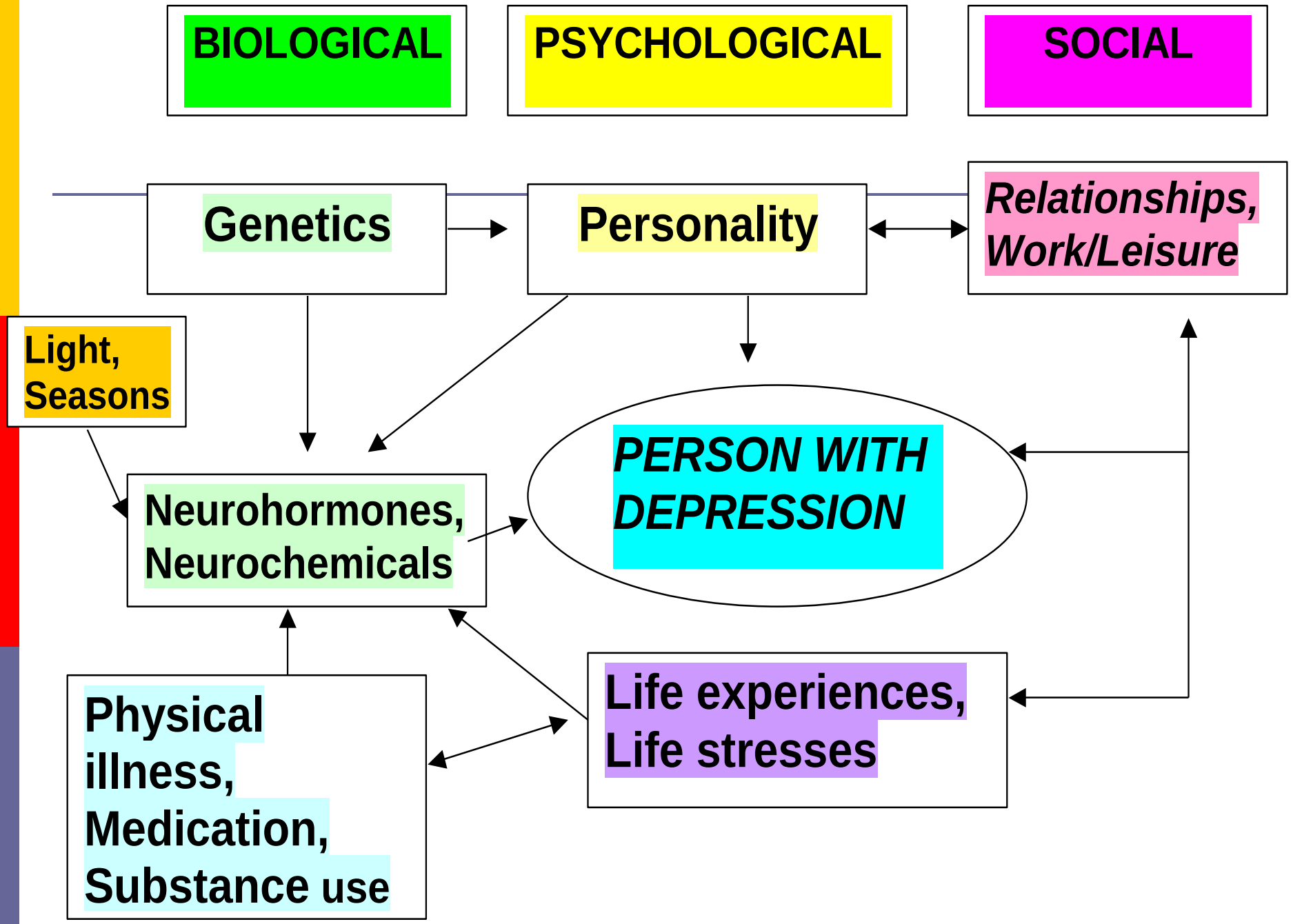


# What do we know now – Type 2 Diabetes

- **Diabetes is very difficult to manage for the patient and the health professional**
- **Better systems would improve care**
- **New attitudes and skills required for health professionals**
- **Activated patients**
- **Clinical targets vs quality of life**
- **Life trajectory and the diabetes trajectory interact powerfully**

# What do we know now – Clinical Depression

- **Depression is a complex long term condition**
- **Its management often fails**
  - **Identification, medication, follow-up and therapy**
- **System shortfall**
- **Depression trajectory**
- **In the presence of a chronic disease, depression is under recognised, under diagnosed and under treated despite clear evidence that depression is a risk factor for poor outcome.**
- **World Health Organisation states that two thirds of co-morbid depression is missed in normal consulting.**


BIOLOGICAL
PSYCHOLOGICAL
SOCIAL
Genetics
Personality
Relationships, Work/Leisure
Light, Seasons
PERSON WITH DEPRESSION
Neurohormones, Neurochemicals
Physical illness, Medication, Substance use
Life experiences, Life stresses

# What do we know now – Co-morbid depression in diabetes

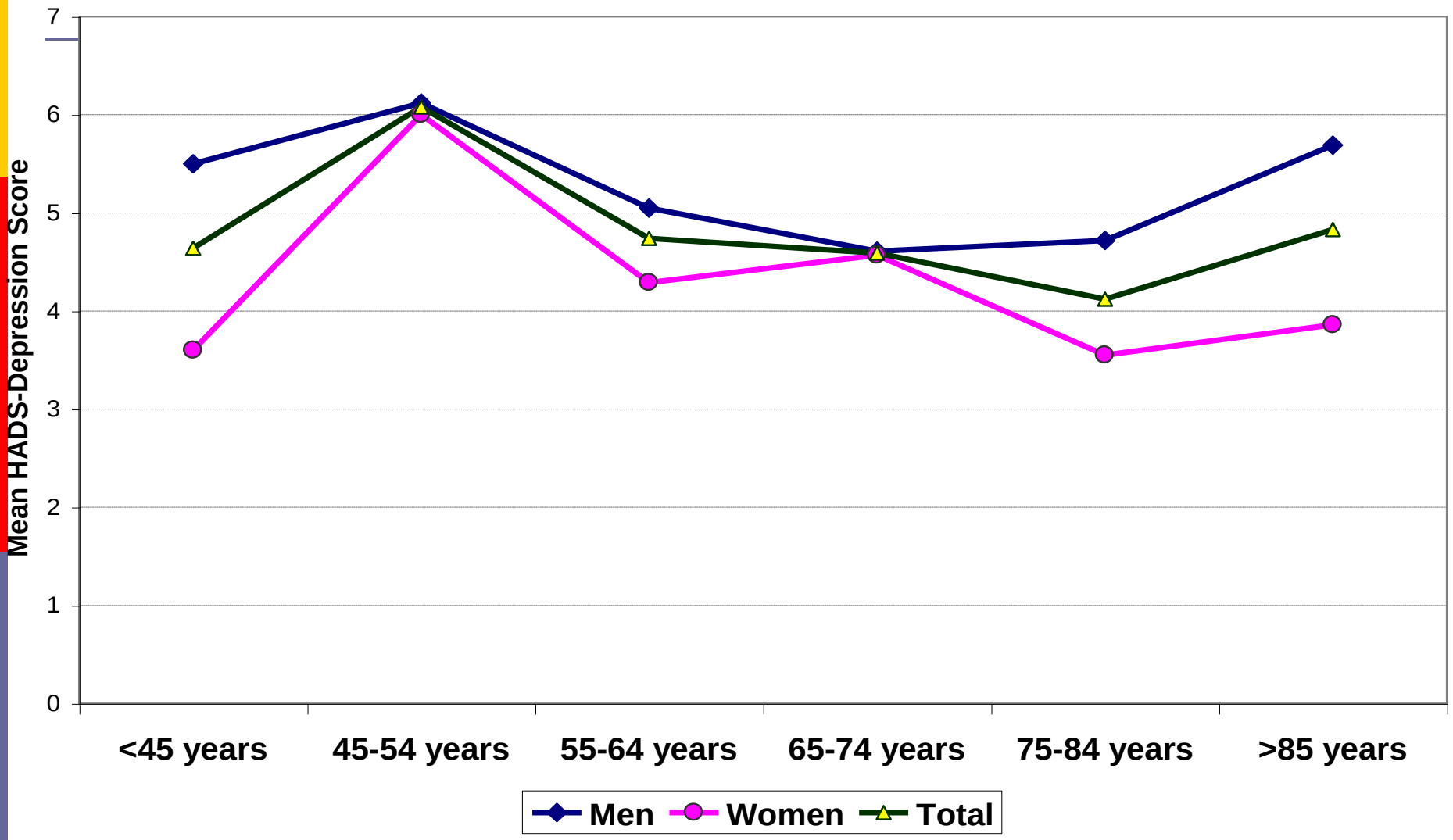
- **Diabetes and depression is a devastating combination**
- **International evidence on outcomes**
- **Australian evidence matches international evidence**
- **Internationally, guidelines for heart disease and diabetes management recommend screening for depression but**
  - **Diabetes Australia / RACGP guidelines do not include screening for depression**

# Depression in a clinical sample with type 2 diabetes

- N = 561 patients in 7 primary care medical practices in Victoria (309 men, 252 women)
- Age 33 to 90 years
- Language: 95.7% English-speaking
- Education: 31.0% completed high school +
- Depression (non-standardised %)
  - **HADS-D (12.0% mild, 9.2% mod-severe)**
  - **PHQ9 (12.2% minor, 11.4% major)**

**Reddy *et al*. 2008**

# Depression scores by gender and age, n = 561 type 2 diabetes in medical practices




Reddy *et al*. 2008

# History of depression among people with type 2 diabetes

**Current Depression is related to**

- Previous recent episode of depression
  - **Previous episode yes No Dep 29% vs 60% Dep**
  - **Occurred < 1 year ago No Dep 24% vs Dep 38%**
- Use of antidepressant medication
  - **Currently using No Dep 22% vs 40% Dep**

**Depression is <u>not</u> related to** treatment for previous episode of depression

- **Receiving medication (49% of total sample)**
- **Receiving therapy (5% of total sample)**
- **Receiving no treatment (46% of total sample)**

**Reddy et al. 2008**

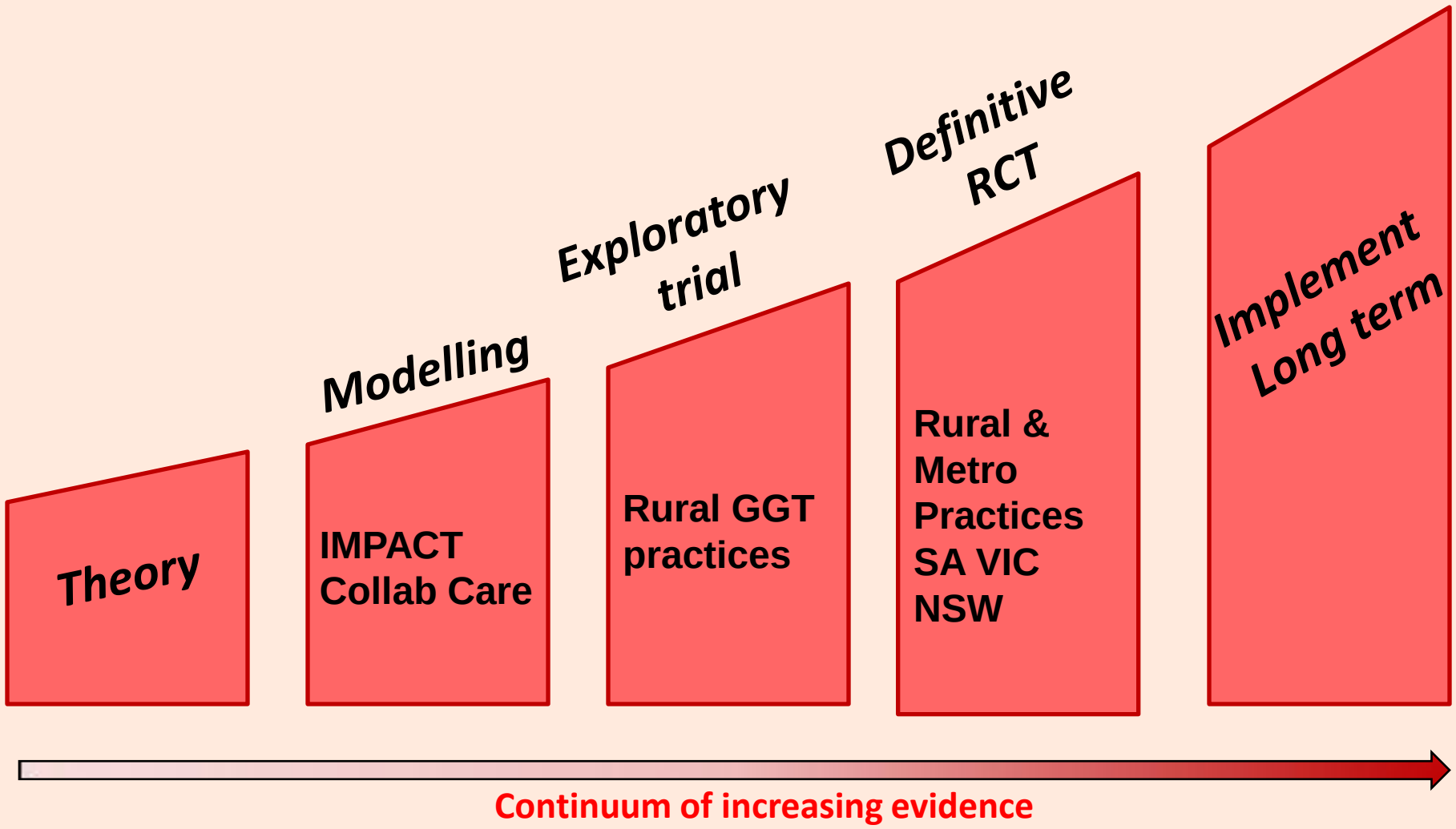
# Patient Health Questionnaire - 9

| Over the last 2 weeks, how often have your been bothered by any of the following problems? | Not depressed group mean | | Depressed group mean |
|---|---|---|---|
| 1. Little interest or pleasure in doing things | 0.18 | | 1.76 |
| 2. Feeling down, depressed or hopeless | 0.18 | | 1.75 |
| **3. Trouble falling asleep, or sleeping too much** | 0.68 | | 2.27 |
| **4. Feeling tired or having little energy** | 0.78 | | 2.55 |
| **5. Poor appetite or overeating** | 0.39 | | 1.95 |
| 6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down | 0.14 | | 1.59 |
| 7. Trouble concentrating on things, such as reading the newspaper or watching television | 0.14 | | 1.45 |
| 8. Moving or speaking more slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual | 0.10 | | 1.31 |
| 9. Thought that you would be better off dead, or hurting yourself in some way | 0.05 | | 0.71 |

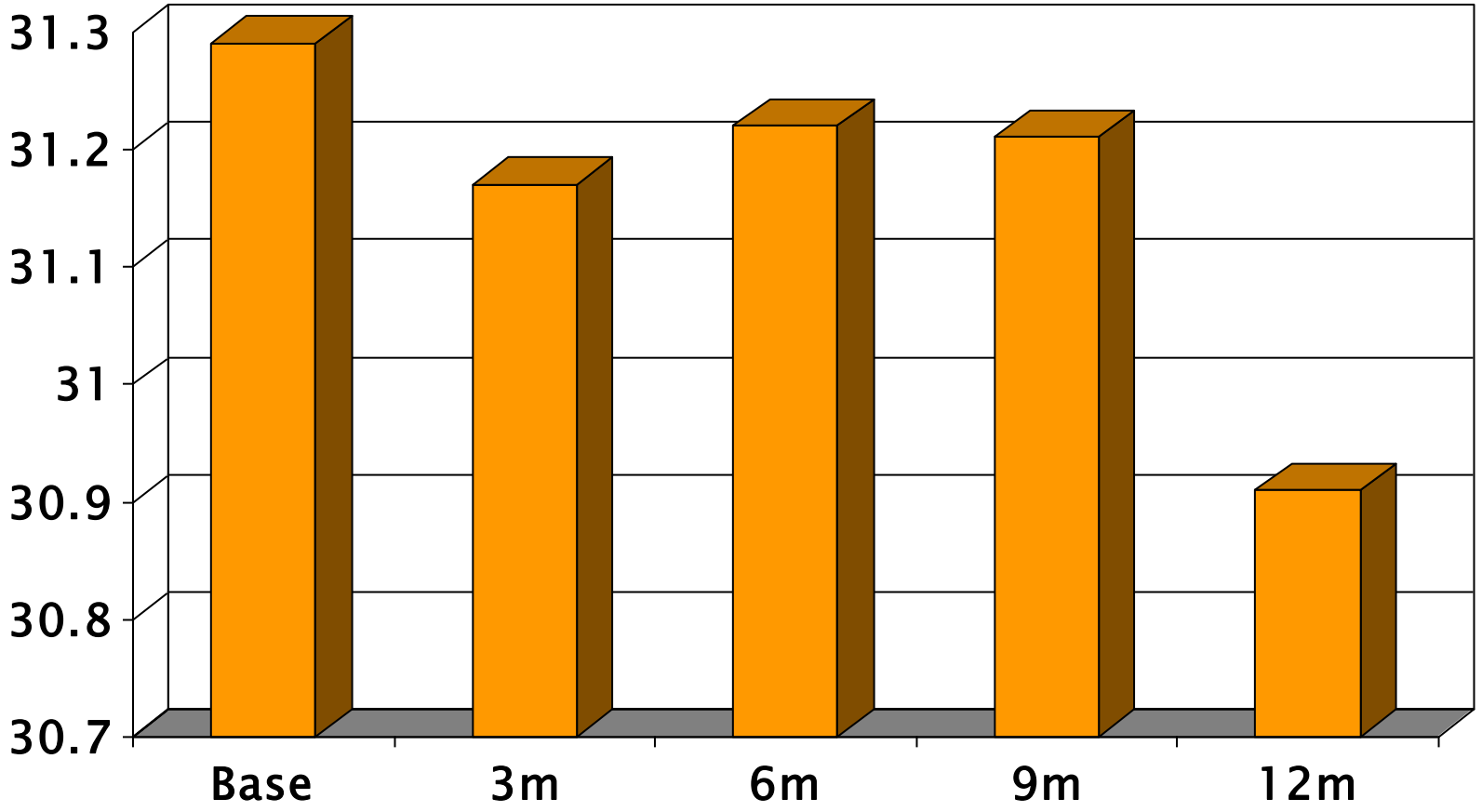
# TrueBlue Collaborative Care for Diabetes, Heart Disease and Co-morbid Depression

- Based on the IMPACT model
- Recognises depression as a complicating factor in chronic disease management
- Patients are screened with PHQ-9
- Nurse as case manager

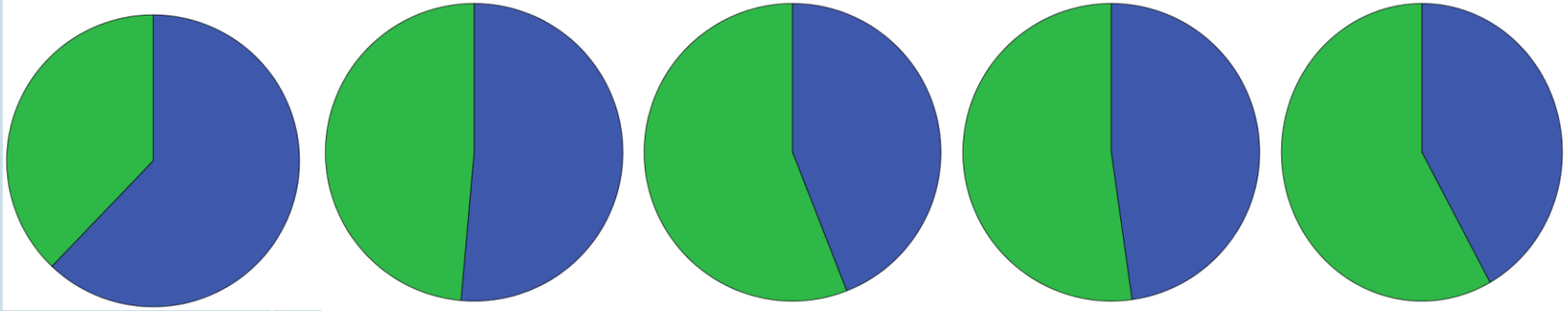
# Location of Study Practices


Theory
Modelling
IMPACT
Collab Care
Exploratory trial
Rural GGT practices
Definitive RCT
Rural & Metro Practices SA VIC NSW
Implement Long term
Continuum of increasing evidence

# Changes in mean BMI over 12 months

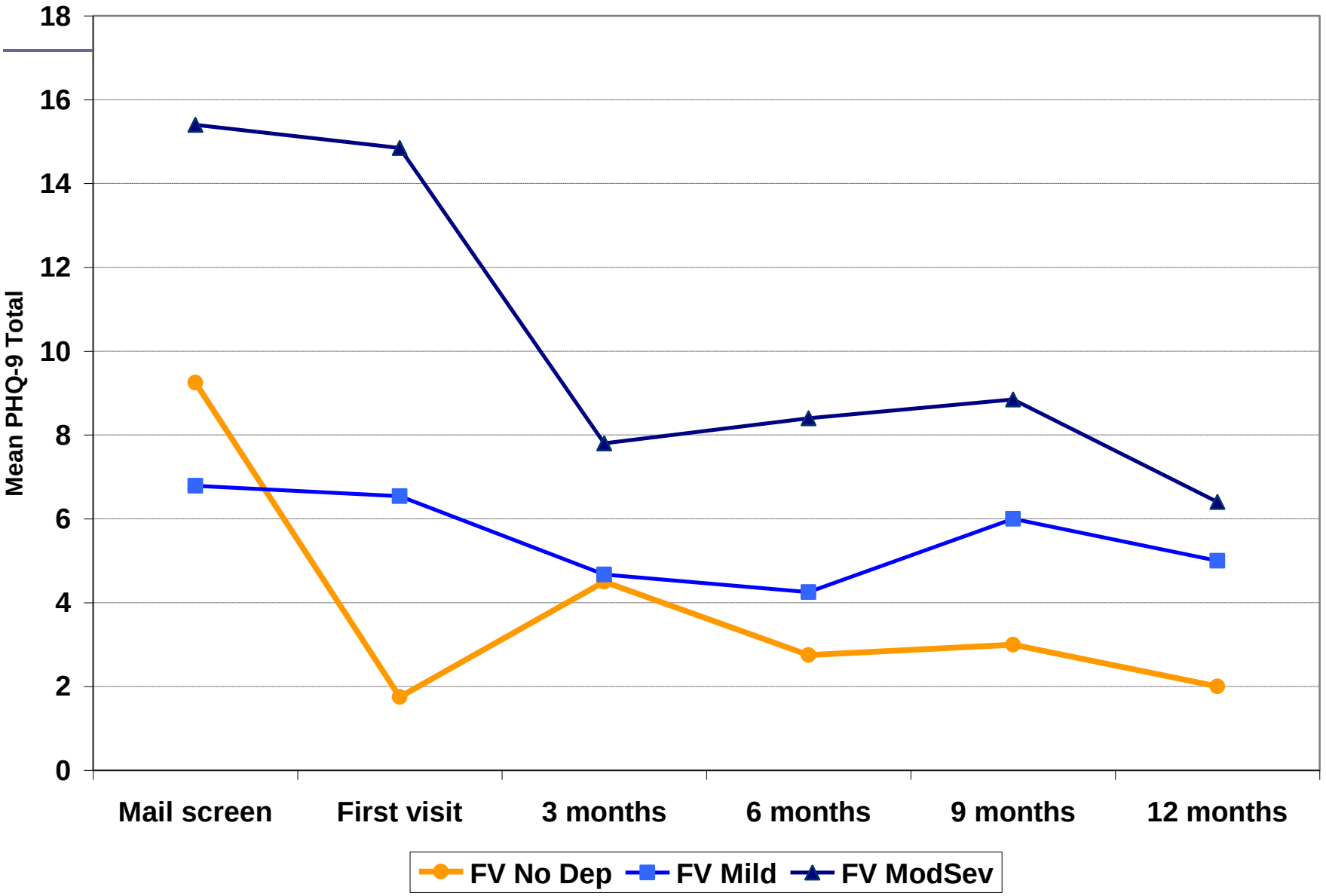


# Patient exercise patterns

| Baseline | 3 months | 6 months | 9 months | 12 months |
|---|---|---|---|---|
|  | | | | |

Patients who are exercising 30 mins per day 5 days per week.
Green: patients who are
Blue: patients who are not

# Mean PHQ-9 total scores by depression category at first visit



# Summary of findings

- **Prevalence of depression in T2DM**
  - 10-20% depending on measures
- **Depression related to all components of hardiness**
- **Hardiness related to:**
  - Low depression, low anxiety, high social support
  - Low smoking, low overweight and obesity, high physical activity
  - High use of available professional resources, high knowledge of clinical targets for HbA1c, Chol, BP

# Benefits of TrueBlue model

- Enhanced access to medical resources
- Improved continuity and regularity of care through nurse coordination
- Exploration of barriers and concerns related to disease management
- Depression is treated leading to improved disease management outcomes

- True Blue uses existing clinical staff (practice nurses)
- Funded within existing Medicare arrangements
- Makes for more sustainable care (saves GPs time, greater patient satisfaction)

# The riddle of CDM

What doesn't work?

- Education not effective on its own
- Guidelines not effective on their own
- Screening not effective unless linked to follow-up
- Feedback no benefit on its own

# Hope & CDM

**What does work:**

- Patient registry
- Care co-ordination
- Proactive follow-up
- Diagnostic assessment


Depressed For
No Reason
Depressed For
A Good Reason
Still Depressed
UN-
DONE
JUST
DEPRESSED,
DON'T
WANT TO
ANALYZE
IT

Range of potential factors and Inputs: Beliefs, Aspirations, Observations, Experiences, Attitudes, Aptitudes, Interpersonal Dynamics, Emotions, Education, Knowledge, Health, Energy Level, Distractions, Disabilities, etc., which constitute the circumstances, context, and parameters of the specific decision or judgment to be made by this decision maker at this time.

Rote Training and Practice

Cognitive Heuristics

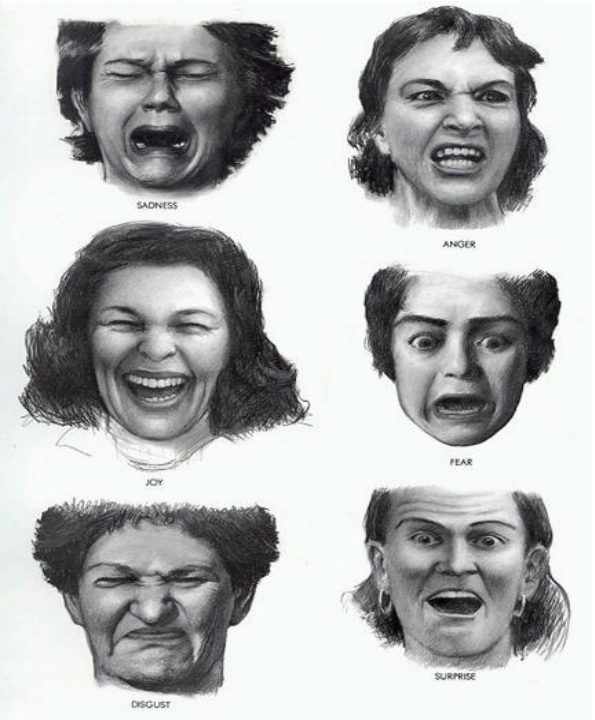
Critical Thinking and Meta-cognition

System-1:

Reactive
Instinctive
Quick
Holistic

System-2:

Reflective
Deliberative
Analytical
Procedural




Resulting decision or judgment about what to believe or what to do.

Prospective or retrospective articulation of decision or judgment in terms of reasons, options, and whatever the person considers to be a relevant consideration.

# Future research questions

- **How can Australia develop a system for primary care that embodies clinical effectiveness?**
  - **National guideline production and implementation**
  - **Audit of clinical outcome against guidelines**
  - **IT systems for audit and decision support**
  - **Training for clinical leadership and teamwork**
- **Longitudinal studies of suspected pathophysiological mediators eg cytokines, HPA**
- **Long-term studies of management of co-morbid depression and diabetes**

# Subjective well-being: the experienced self and the remembered self

**Research consistently shows that long-term positive well-being is related to:**

- **Strong relationships**
- **Having a sense of meaning or purpose (commitment)**
- **Contributing to the lives of others**
- **A sense of control in our lives**
- **Wanting and appreciating what we have**
- **Creating and retaining positive memories**