Matching research agendas to the action strategies for preventing obesity and diabetes

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Edgar Diabetes and Obesity Research University of Otago 10 year anniversary symposium





Reflections on diabetes and obesity research

- Investments in research
 - Investigator-driven research (the natural inclinations of Homo Scientificus) vs targeted research
- Two helpful paradigms
 - Problem-oriented and solution-oriented research
 - Strategic Science'
- Roles and risks of public health research
 - Current Dirty Politics saga
 - Example benchmarking government progress
- Challenges and opportunities ahead
 - Healthy Families NZ



Pima Indians

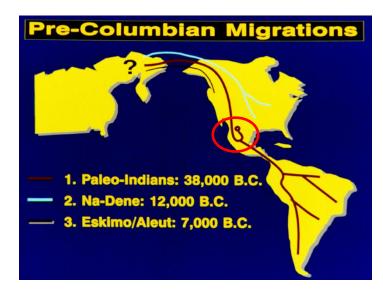


Arizona Pimas

• 70% obesity, 45% diabetes

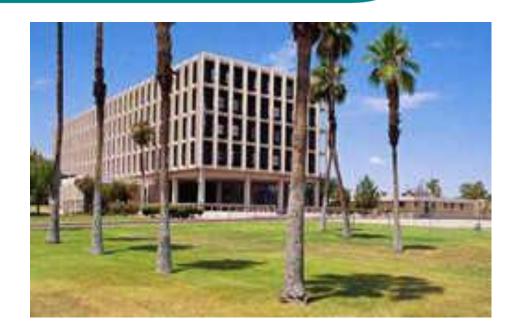
Mexico Pimas

• 15% obesity, 7% diabetes











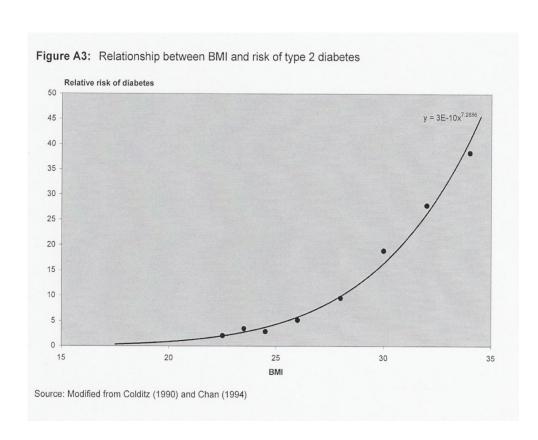






Obesity and diabetes research

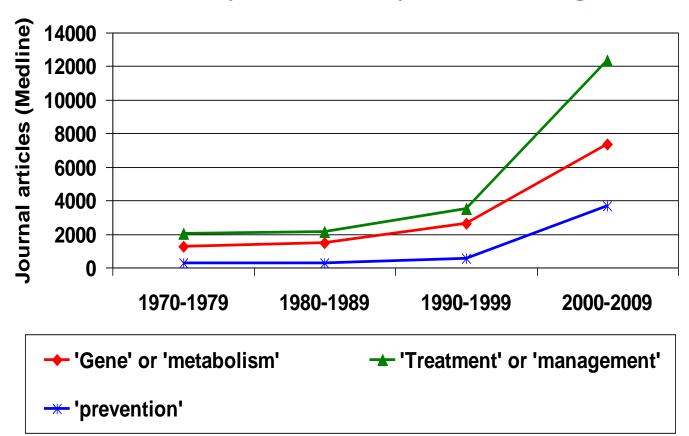
- Obesity as the normal physiological response to an abnormal (obesogenic) environment
- Overweight and obesity as the driver of type 2 diabetes





Publications in obesity research

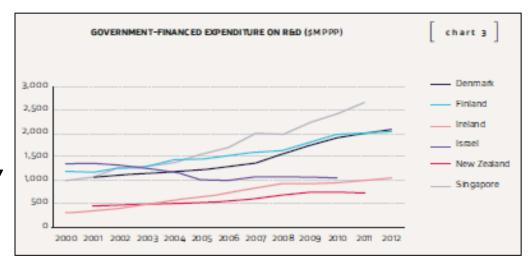
Medline journal article numbers referenced with 'Obesity' and other key MeSH headings





Targeted research

- National Science Challenges
 - Targeted themes and projects
 - Major 'challenge'
 is the low total
 investment in
 research





Why invest in science?



- 1. Productivity and sustainable economic development
- An evidence base for addressing key concerns, developing good public policy and ensuring a better informed public
- 3. Ensuring we have the skills in our workforce and society to become an innovation-led economy



Preventing Childhood Obesity

(Robinson T, Sirard J Am J Prev Med, 2005)

Problem-oriented

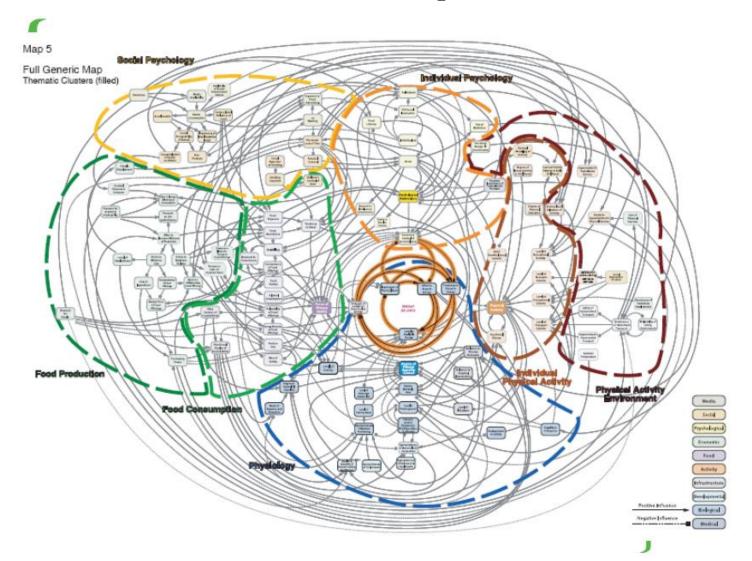
- Causes and correlates of disease
- Past orientation
- Reductionist approach
- Understanding the causes may or may not help with solutions
- Usually easier to perform

Solution-oriented

- Causes of improved health, reduced risks
- Future orientation
- Experimental approach
- Solutions need to be tested
- Usually harder to perform



The causes of obesity





Litmus test for research

- 1. Can you draw conclusions no matter what the result (positive, negative, null)?
- 2. Will the result change what you would do at a clinical, policy or public level?



'Strategic Science' (Kelly Brownell)

1. Policy relevant research questions

Preferably co-created

2. Collaborative research with end-users

- Often end-users as co-investigators
- Potentially using end-users' data sets (Integrated Data Infrastructure)

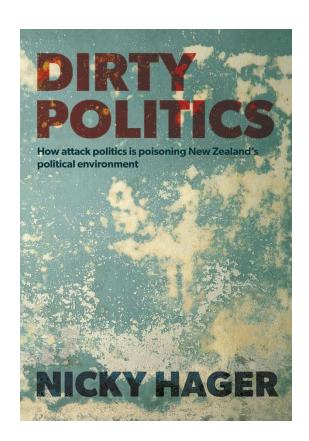
3. Robust knowledge exchange systems

- Links with policy-makers
- Practitioner knowledge exchange networks
- Advocacy organisations



Challenges of public health research

- 'Public health is politics'
- Clash with commercial interests
- Disease 'vectors':
 - Tobacco
 - Alcohol
 - Junk food



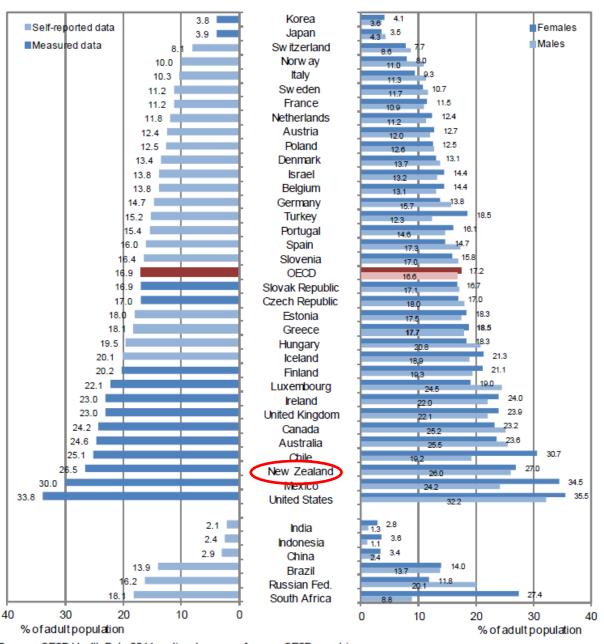


Dr Margaret Chan

Director General World Health Organisation June 2013

"Let me remind you. Not one single country has managed to turn around its obesity epidemic in all age groups. This is not a failure of individual will-power. This is a failure of political will to take on big business"

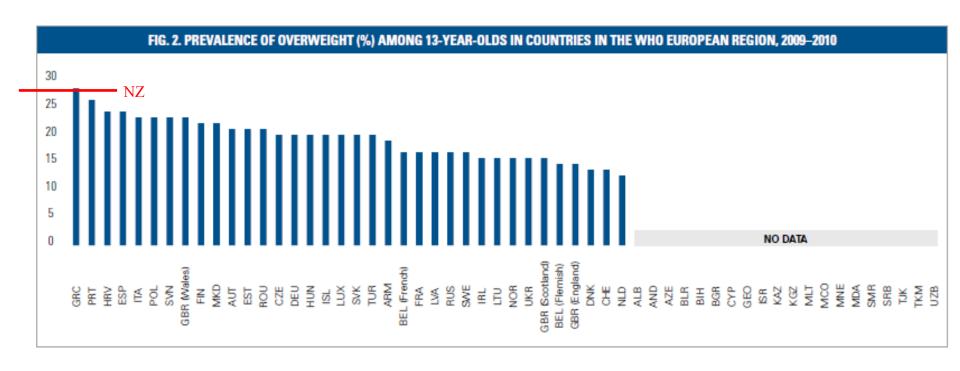
Adults:
NZ is the
third fattest
in OECD
after USA
and Mexico



Source: OECD Health Data 2011; national sources for non-OECD countries.



Overweight in European adolescents



(If NZ used WHO definitions, the prevalence would be higher)

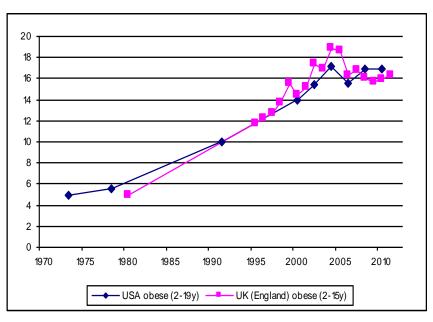


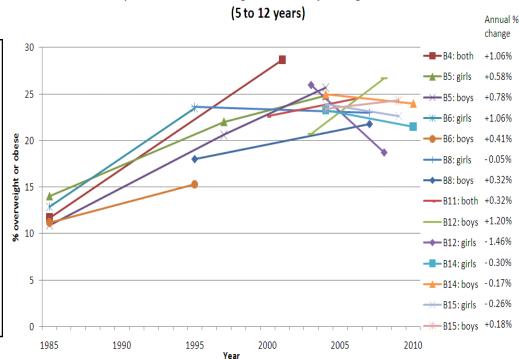
Plateau effect in prevalence rise in childhood overweight and obesity

US and UK

Australia

Trends in prevalence of overweight and obesity among Australian children





Comparative risk assessment rankings

Lim et al Lancet 2012

Adult high BMI

#1 risk factor in NZ & Australia

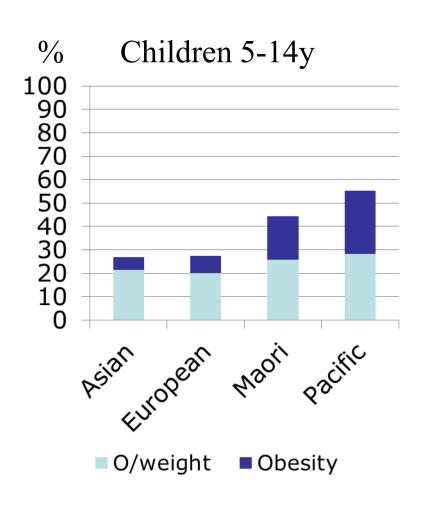
NZ burden 2010

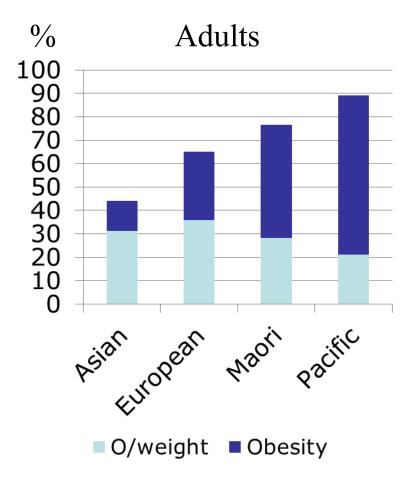
- Poor diet 11.1%
- High BMI 8.9%
- Tobacco 8.6%

Ranking legend 1-5 6-10 11-15 16-20 21-25 26-30 33-35 36-40 340 Rank factor	Global	High-income Asia-Padřic	Western furspe	Aust rales is	High-Isoome North-America	Central Burope	Southern Latin America	Eastern Europe	East Asia	Tropical Latin America	Central Latin America	Southeat Asia	Central Asia	Andean Latin America	North Afficiand Middle East	Caribbean	SouthAsia	Oceania	Southern sub-Saharan Africa	Eastern sub-Saharan A filos	Central sub-Salarae Africa	Western sub-Saharan Airica
High blood pressure	1	1	2	3	4	1	2	2	1	2	4	1	1	2	1	1	3	6	2	6	5	6
Tobacco smoking, including second-hand smoke	2	2	1	2	1	3	3	3	2	4	5	2	3	5	3	3	2	3	5	7	12	10
Alcoholuse	3	3	4	4	3	2	- 4	1	6	1	1	6	2	1	11	5	8	5	1	5	- 6	5
Household air pollution from solid fuels	4	42		-		14	23	20	5	18	11	3	12	7	13	9	1	4	7	2	2	2
Diet low in fruits	5	5	7	T	7	5	- 6	5	3	6	7	4	5	10	- 6	8	5	9	8	8	11	13
High body-mass index	- 6	8		1	2	4	1	4	9	3	2	9	4	3	2	2	17	2	3	14	18	15
High fasting plasma glucose	7	7	6	6	<u> </u>	7	5	10	8	5	3	5	7	6	- 4	4	7	1	- 6	10	13	11
Childhood underweight	8	39	38	37	39	38	38	38	38	32	23	13	25	18	71	14	4	8	9	1	- 1	1
Ambient particulate matter pollution	9	9	11	26	14	12	24	14	4	27	19	11	10	24	7	19	6	32	25	16	14	7
Physical inactivity and low physical activity	10	-4	5	5	6	6	7	7	10	8	- 6	8	9	8	5	7	11	7	11	15	15	16
Diet high in sodium	11	6	10	11	11	9	11	9	7	9	13	7	6	13	8	15	14	16	13	21	17	18
Diet low in nuts and weds	12	11	9	8	8	8	8	8	12	10	8	15	8	12	9	10	13	13	16	22	16	21
Iron deficiency	13	20	32	21	35	72	17	21	19	14	12	12	IJ	4	12	6	9	11	10	4	4	4
Suboptimal breastfeeding	14			-			27		24	72	15	14	16	9	15	13	10	10	4	3	3	3
High total cholesterol	15	12	8	9	9	10	9	6	13	11	10	16	14	16	10	16	20	14	19	28	27	30
Diet low in whole grains	16	10	16	16	17	11	12	11	11	12	14	76	13	IJ	14	12	15	15	32	24	19	24
Diet low in vegetables	17	14	13	12	13	13	10	12	15	16	20	10	11	14	18	11	16	12	15	23	23	20
Diet low in seafood omega-3 fatty acids	18	IJ	15	13	16	16	14	13	17	17	18	19	15	23	16	17	18	20	23	27	25	25
Drugue	19	13	14	10	10	20	13	17	18	13	16	18	20	11	19	18	72	19	12	19	24	72
Occupational risk factors for injuries	20	24	24	20	25	76	16	75	20	19	72	73	21	21	23	31	12	72	72	20	72	17
Occupational lowback pain	21	15	IJ	15	73	18	20	24	14	15	24	17	24	22	20	26	23	17	24	17	21	19
Diet high in processed meat	22	72	12	14	12	15	18	15	29	7	9	77	19	15	27	24	25	77	28	31	28	78
Intimate partner violence	23	18	72	73	72	75	21	72	21	23	26	72	77	19	75	23	21	25	14	18	20	73
Diet low in fibre	24	16	18	18	18	19	15	16	16	25	28	20	18	28	72	72	33	21	33	36	34	36
Unimproved sunitation	25	38	39	39	41	47	40	40	40	40	38	30	T	31	32	28	19	18	18	9	8	9
Lead exposure	26	73	21	19	24	17	19	73	72	20	25	24	73	20	76	21	24	30	20	25	26	26
Diet low in polyumaturated fatty acids	27	19	19	17	20	21	72	18	76	24	27	21	72	29	24	25	32	23	30	33	30	29
Diet high in trans fatty acids	28	29	73	24	15	73	28	19	78	21	21	33	26	77	17	38	78	34	35	37	36	37
	29	80	80	38	40	41	41	42	43	41	37	32	34	34	37	33	30	31	17	11	7	8
VitaminA deficiency Occupational particulate matter, gases, and furnes	30	34	33	32	28	32	33	31	73	29	32	78	29	33	31	34	26	33	29	29	29	31
Zinc deficiency	31	39	33	36	37	39	39	39	39	39	3 ²	29	28	25	35	27	31	28	29	13	10	14
Diet high in sugar-sweetened beverages	32	28	31	31	19	33	26	27	37	26	17	25	32	30	78	20	27	26	26	32	32	34
Childhood sexual abuse	33	26	25	72	21	30	25	26	30	28	30	37	30	26	29	30	29	35	31	26	31	27
Unimproved water source	34	41	41	40	38	40	42	41	42	42	4D	31	36	35	30	29	34	24	27	12	9	12
Low bone mineral density	35	71	20	25	76	24	30	78	25	30	33	35	35	36	34	32	36	37	38	35	37	33
-	35	33	35	34	36	35	35		33	33	31	34	31	32	36	35	37	36	3A	30	33	32
Occupational noise		33	35	39	30	35	32	35 34	33		35	38	33	40	38	35 40	37	30 41	37	41	42	42
Occupational carcinogens	37		28	27					31	38						_	33 80	_				_
Diet low in calcium	38	75	-		29	27	29	30		34	39	39	39	39	40	37	-	39	39	38	39	38
Ambient corne pollution	39	36 32	36	41 35	33	36 28	43 36	37	34	43	43	43	43	43	43	43	35 41	43	43	42	38 43	41
Revidential radon	40	-	-			_	_	33		36		-	3"		_	-	41		_	43		43
Diet low in milk	41	77	29	30	30	29	34	32	35	37	42	40	41	41	42	39	44	40	41	39	41	39
Occupational authmagens	42	35	34	33	34	37	37	36	41	35	36	36	42	37	39	36	38	29	36	34	35	35
Diet high in red meat	43	30	30	78	32	31	31	29	30	31	34	42	40	34	33	41	43	38	40	40	40	40



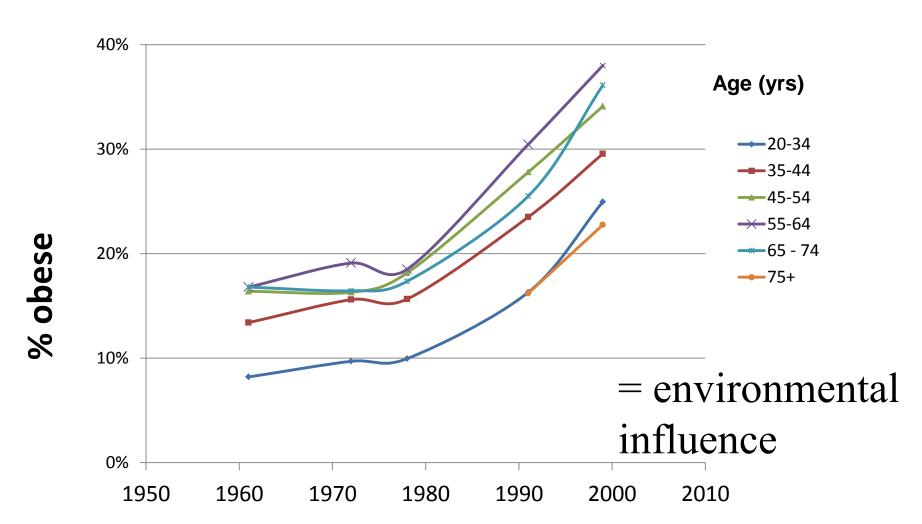
NZ overweight/obesity by ethnicity







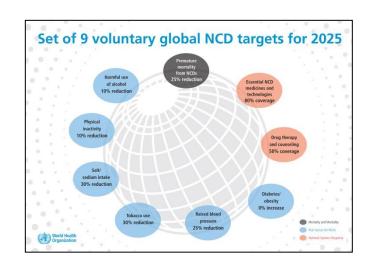
Obesity increase by age group





What needs to be done?



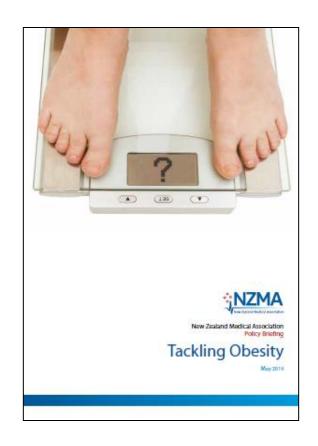






NZMA: Tackling Obesity

- Policy briefing
- Top Ten recommendations
 - Government
 - Local government
 - Health professionals
 - Communities





Recommendations 1-5

Health professionals should take every opportunity to engage sensitively with patients who are obese, providing them with advice for healthy living and directing them to exercise and nutrition programmes as appropriate. Recognising and acting on obesity in childhood is of particular importance.

Engage with & support patients

Community-based approaches to obesity, as well as nutrition and exercise programmes, should be expanded across the country.

These approaches need to be complemented by policy and regulatory initiatives.

Community-based approaches

Greater protection from the marketing of unhealthy food should be afforded to children. This should entail a more stringent statutory regulatory regime that addresses all forms of marketing including product packaging and sponsorships.

Restrict marketing to children

The use of fiscal instruments in the New Zealand context should be evaluated as a means of influencing food consumption, with priority given to a tax for SSB.

Tax on sugary drinks

A consistent and easy-to-understand food labelling system, preferably the traffic light concept, should be developed and implemented on the front of packaging to help inform consumers about their food choices. Restaurants and fast food outlets should be encouraged to develop visible calorie indicators.

Front of pack labelling

5



Recommendations 5-10

Food and nutrition guidelines should be introduced in school canteens and in all public services including hospitals.

Healthy food: schools, hospitals

Nutrition should be included as part of the mandatory curriculum in schools.

Nutrition in curriculum

The licensing of fast food premises should be audited by local authorities, with a view to reducing the proximity of fast food outlets to schools and leisure centres.

Restrict fast food outlets

Local authorities should work with public health officials to conduct health impact assessments of planning decisions to facilitate urban environments that support physical activity.

Urban planning for PA

The concept of a health target around the provision of healthy living advice for pregnant women should be considered, eventually expanding this to all patients.

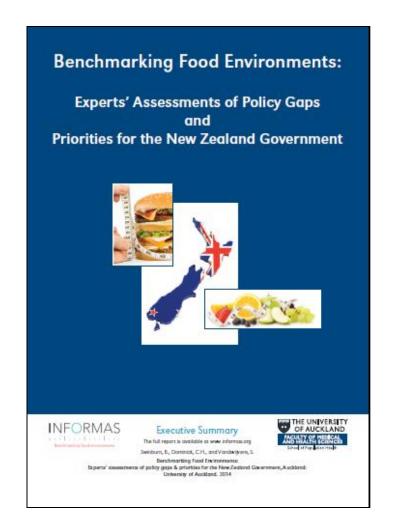
Health target: advice in pregnancy

10



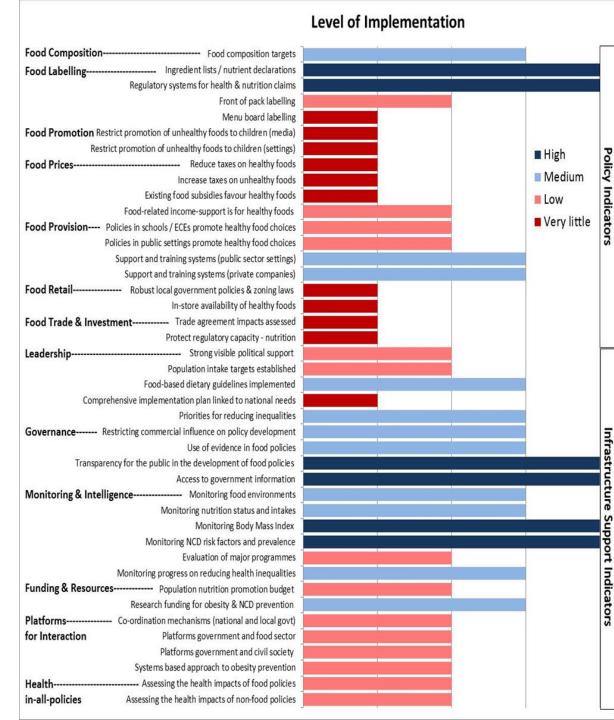
Benchmarking food policy progress

- 52 member Expert Panel
- 42 indicators:
 - Policy implementation
 - Infrastructure support
- Verified evidence of implementation
- Benchmarks: international best practice
- Rated implementation
- Prioritised actions



NZ Food-EPI

- Positives: international standard in 6
- Stronger infrastructure than specific policies
- Major gaps in implementation
 - Marketing to children
 - Fiscal policies
 - Comprehensive plans & funding





Top priorities (out of 34 actions)

- 1. Comprehensive plan
- 2. Targets
 - Childhood obesity
 - Population intakes
 Na, SFA, sugar
 - Food composition
- 3. Funding (\$70m/y)
- 4. Restrict marketing to children

- 5. Healthy food policies
 - Schools
 - Early childhood settings
- 6. Health Star Rating food labelling
- 7. 20% excise tax on sugary drinks



Community-based approaches

- Important complement to policy/regulatory approaches
- Healthy Families NZ about to be launched
 - 10 areas in NZ
 - \$40m over 4 years
 - Modelled on Healthy Together Victoria
- HTV arose out of overarching funding for Australian states/LGAs for obesity prevention
- Based on proof of principle from successful demonstration projects reducing childhood obesity



Healthy Families NZ

- Close links with Victoria
 - MoU, sharing materials, training, support etc
- Sites announced
 - Currently choosing providers
- High speed to implementation
 - Months rather than years
- Important opportunity for regions to seize
 - Political moment
 - HFNZ action at ground level (eg training, networks)
 - National components (eg achievement program, social marketing)



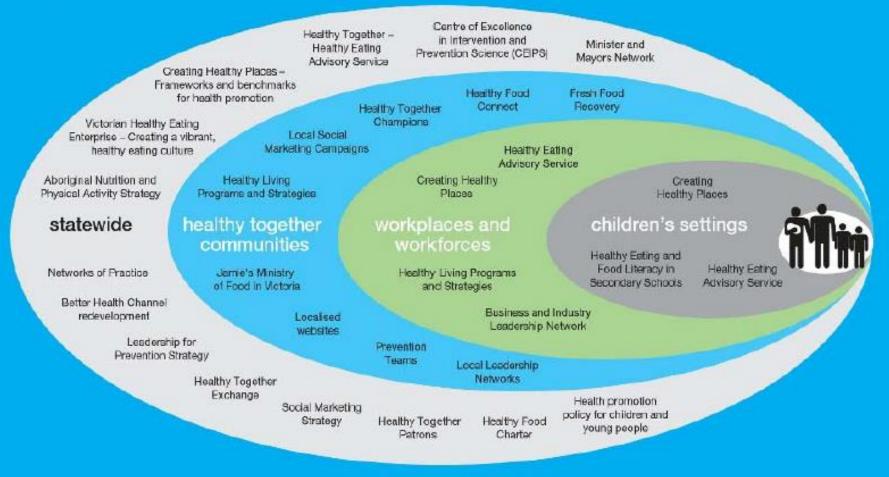
Victoria – a systems approach to prevention

- Using funding to strengthen prevention systems (~\$1b over 9 years across Australia)
- Victorian health minister as a champion of government, community and personal action on healthy eating and PA
- A vision of sustained 'activating systems' approach – <u>not projects</u>
- Empower and fund local govt and communities





Improving people's health where they live, learn, work and play



Healthy Together Communities

Local government areas

520

938

4,409

Workplaces

Over 1.3 million Victoriana

Hardly supplier Violeta and jointy function (delineral fix stant economical of recient

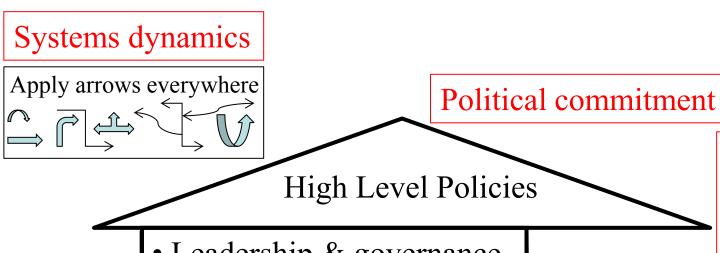




Key components of HTV

- Champions program
 - Mayors Club, Jamie Oliver, local leadership groups
- Achievement Award program
 - Quality assurance system, early progress results
- 12 sites for intensive intervention
 - Randomised pair selection of sites
 - >100 new staff on the ground
- Training and networks of practice
- Evaluation
 - Measuring how to activate systems and what the impacts are – especially on childhood obesity

The Full Prevention House



Specific actions

– people and
food & PA envs

- Leadership & governance
- Information & intelligence
- Finances & resources
- Networks & partnerships
- Workforce development
- Health in all policies

Service delivery, programs, policies



System & capacity building blocks



Implications for NZ and Otago

- HFNZ is an important opportunity to seize
- Sufficient resources in DHBs, councils, NGOs, HFNZ sites, iwi, and community groups for region-wide approaches
- Needs high level leadership to drive the challenges of re-orientation, engagement of many players, co-ordination of efforts, resource mobilisation, new thinking etc
- Could be packaged into building a Prevention System for the region
- Incorporate primary care



Conclusions

- Congratulations to the Edgar Diabetes and Obesity Research team
 - Look forward to their ongoing leadership in 'strategic', 'solution-oriented' research
- Challenges ahead
 - Insufficient research dollars
 - Implementation research
 - Battling the toxic tactics of 'Big Junk Food'
- Opportunities ahead
 - Healthy Families NZ
 - Region-wide activation
 - Collaborations on the National Science Challenges