

The significance of Development Origins of Health and Disease (DOHAD)



Objectives of Presentation:-

1. To introduce and make Pacific Nurses aware of the Pacific Science for Health Literacy Project (PSHLP).
2. To acknowledge the significant roles nurses play in the prevention and control of the NCD Epidemic in their own countries and in the Pacific Region.
3. To encourage capacity development amongst our Pacific Nurses in the area of Research especially in Health and Development in the Pacific.

What is the evidence?

Top 10 countries / territories for obesity in the world

Data from the World Health Organization 2012

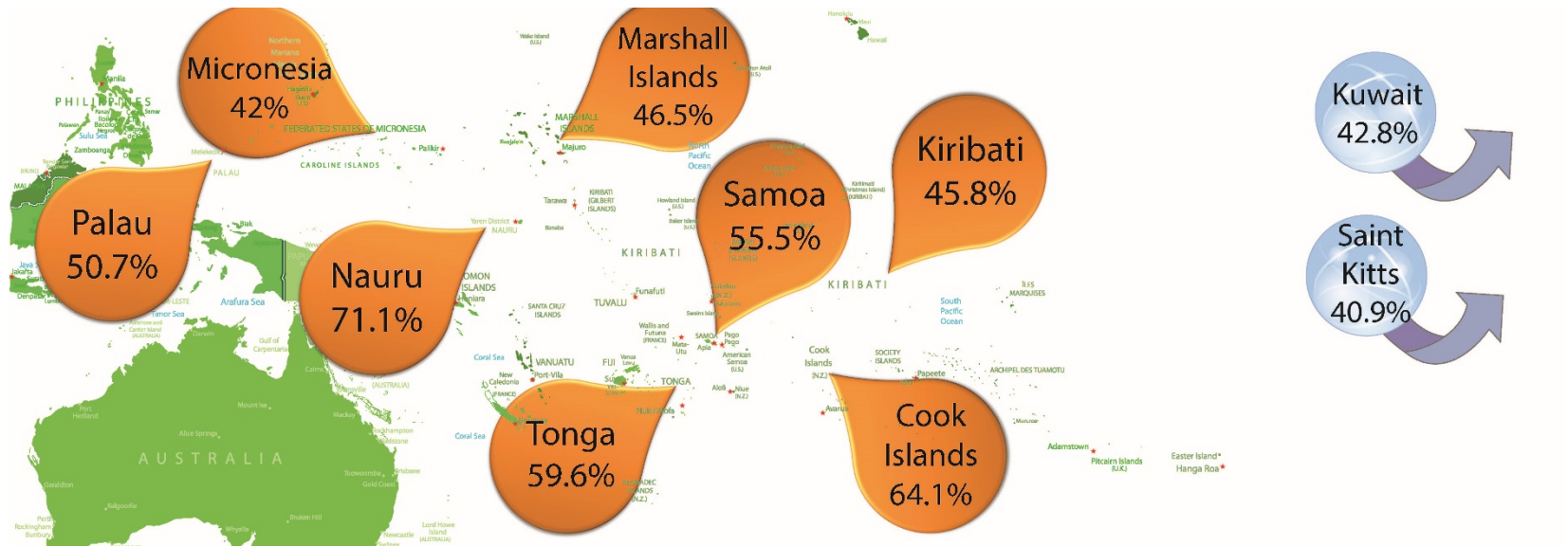
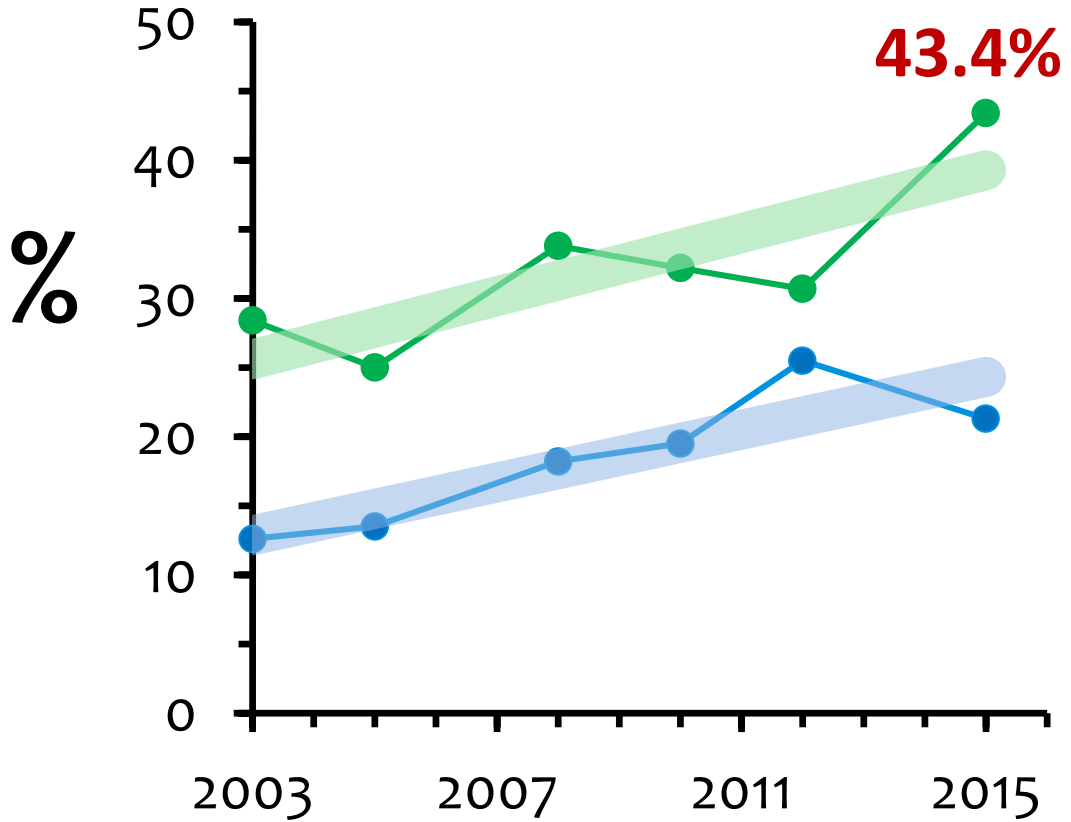


Table 1: Noncommunicable Disease Mortality and Risk in a Selection of Pacific Nations Data source: World Health Organisation

Nation	Death from NCDs	NCD deaths under Age-60	Adult Population					
			Overweight / Obese	Physical Inactivity	Tobacco use daily	Raised Blood Pressure	Raised Blood Glucose	Raised Cholesterol
Australia	90%	11.1%	64% / 26%	40.3%	16.8%	36.4%	9.4%	57.4%
Cook Islands	74%	35.9%	91% / 64%	72.3%	34.4%	41.5%	20.0%	58.1%
Fiji	77%	42.4%	65% / 30%	-	8.4%	38.8%	13.8%	52.5%
New Zealand	91%	12.6%	66% / 28%	48.1%	20.7%	36.8%	-	57.7%
Nauru	70%	37.9%	93% / 71%	49.4%	47.5%	39.6%	12.5%	44.7%
Kiribati	68%	58.8%	81% / 46%	49.8%	67.4%	33.7%	22.4%	34.8%
Samoa	70%	32.0%	85% / 54%	49.7%	36.2%	40.0%	21.1%	33.7%
Tonga	74%	30.8%	87% / 58%	41.4%	22.0%	40.1%	17.5%	48.7%

Overweight Children and Young People in the Cook Islands 2003 to 2015



STEPS: 2015

18-24 Years
Overweight: 87.2%
Obese: 68.5%

13-17 to 18-24 Years
2-fold increase in
overweight

25-64 Years
Overweight: 91.1%
Obese: 72.2%

● Primary School Age ● Secondary School Age

Recognition: *Identifying the potential of schools as a setting*

2011 UN High-level Meeting on NCDs: [Political declaration](#)

Clause 21: *Recognised social and environmental determinants of NCD risk*

Clause 26: *Recognised the contribution of **developmental processes***

Clause 43: *Recognised the need for **multisectoral population wide interventions***

Clause 43b: *Recognised the **role of education in & out of schools in furthering prevention & control of NCDs***

2013 [WHO Global Action Plan for Prevention & Control of NCDs](#)

*Develop, strengthen and implement, as appropriate, **multisectoral public policies and action plans** to promote **health education and health literacy**, including through evidence-based education and information strategies and programmes **in and out of schools.....***

2015: Commission on Ending Childhood Obesity: [Final Report](#)

*Implement comprehensive programs that promote healthy schools and **health and nutrition literacy** among young people.*

*As teenagers are the next generation of parents, **the importance of health and nutrition literacy in the teenage years cannot be overestimated** – indeed the school years and **the mainstream curricula** offer important opportunities for progress.*

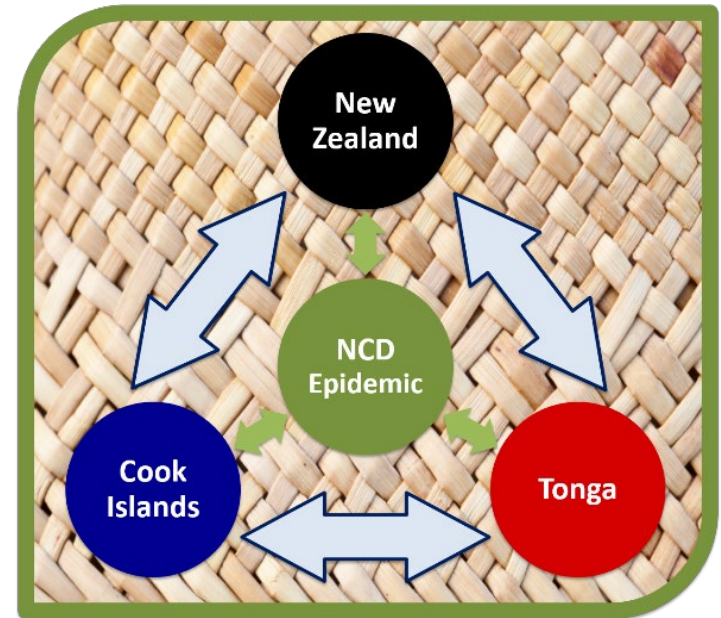
Life course education in schools should be co-constructed with teachers, according to educational criteria and embedded in core curricula subjects.

PACIFIC SCIENCE FOR HEALTH LITERACY PROJECT

Project Goals

Via collaboration between education, health & science:

- Develop and test culturally appropriate learning resources to enable context-embedded science for health literacy education in the Cook Islands and Tonga, within the context of the NCD epidemic.
- Measure programme impact on:
 - Teaching practice
 - The development of scientific and health literacy in adolescents
 - Health knowledge, attitudes and behaviours in adolescents
 - Attitudes towards and behaviours relating to multi-sectoral collaboration in participating institutions
- Enable the **potential** for prospective studies to examine long term health and education impacts



Pacific Science for Health Literacy Project

A world free of the avoidable burden of NCDs

Improving nutrition and associated factors in childhood and adolescence, supporting transgenerational NCD risk reduction.

**SUSTAINABLE
DEVELOPMENT
GOALS**

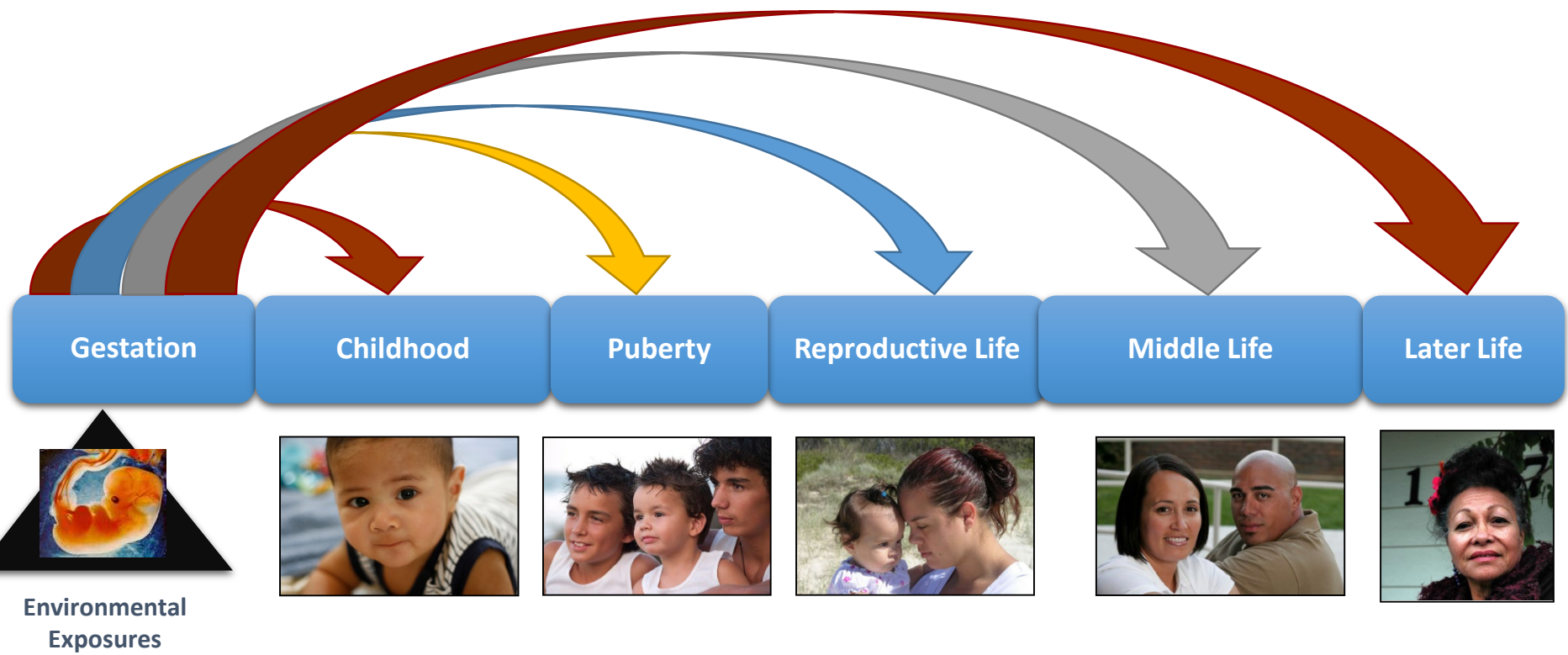


Empowering adolescents as life-long learners capable of engaging in current and future issues; negotiating ethical dilemmas, conflicting evidence, and application of evidence within the frame of social and cultural values.



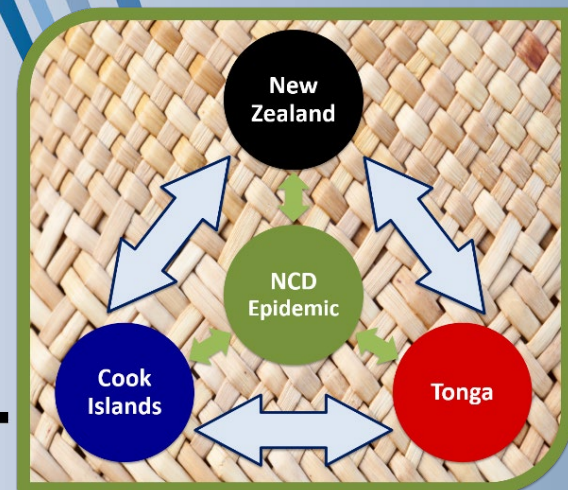
Using educational opportunities to support teenagers to develop capabilities that allow them to investigate NCDs and related issues & take actions to improve their NCD risk; promoting their health & the health of their future children, and contributing to social and economic development in the Cook Islands.

Developmental Origins of Disease: Developmental Exposures Impact Disease Risk Throughout Life



Environmental
Exposures

PACIFIC SCIENCE FOR HEALTH LITERACY PROJECT



Me, Myself, My Environment: Me'akai

Student Book
Tongan Trial Edition



Jacquie Bay, Delaney Yaonga, and



Tereora College
Sustainable Energy Use: For My Ngutuare Tangata & My Kopu Tangata

Student Handbook

NAME: _____

Group: _____

LENScience Bringing Schools and Scientists Together

The Kingdom of Tonga STEPS Survey
Ministry of Health, Kingdom of Tonga
With the World Health Organization

STEPS stands for the STEPS Approach to Surveillance of NCD Risk Factors. There are six components: tobacco use, alcohol and fruit/vegetable intake, physical activity, and blood pressure, blood glucose, and body mass index (BMI).

Percentage of Tongan adults (aged 25-64 years) who are currently at least 5 servings of fruit and vegetables every day:

Year	Men	Women
2004	~10%	~15%
2011	~15%	~20%

World Health Organization
Western Pacific Region

The STEPS Survey has been carried out twice in Tonga, in 2004 and 2011, each time in the same way. The survey is a national survey of the general population. It measures risk factors for NCDs: tobacco use, alcohol, fruit and vegetable intake, physical activity, and blood pressure, blood glucose, and body mass index (BMI).

Cardiovascular Diseases are diseases that affect the heart and blood vessels. They are the most common cause of death in Tonga, and all around the world. There is a very high risk of dying to someone you know if you have these diseases. If a person has 'high blood pressure' they can make changes to their behavior to lower their blood pressure, and the risk of these diseases.

Healthy behaviour changes could include:

- Eating more fruit and vegetables
- Being more physically active
- Stopping smoking
- Stopping drinking alcohol
- Stopping using tobacco

Percentage of Tongan adults (aged 25-64 years) who have high blood pressure:

Year	Men	Women
2004	~45%	~35%
2011	~55%	~45%

DIGESTION OF CARBOHYDRATES

Carbohydrates are broken down into glucose which is transported in the blood stream to our cells.

How does glucose get from the food we eat into our cells?

SMALL INTESTINE:

- Glucose is broken down into the blood to be sent to the liver from where it is transported to the rest of the body.
- Glucose is broken down into the blood to be sent to the rest of the body.

LIVER:

- Glucose is broken down into the blood to be sent to the rest of the body.
- Glucose is broken down into the blood to be sent to the rest of the body.

PANCREAS:

- Glucose is broken down into the blood to be sent to the rest of the body.
- Glucose is broken down into the blood to be sent to the rest of the body.

GLUCOSE: A Journey from plate to cell

A constant supply of energy for 2000 kcal of blood to circulate.

- After a meal the concentration of glucose in the blood rises.
- When we sleep the concentration of glucose in the blood falls.
- The process of keeping blood glucose levels steady is called glucose homeostasis.

How do blood glucose levels stay steady?

INSTRUCTIONS:

Your task is to create a SLICKY booklet to explain how blood glucose levels stay steady.

KEY WORD LIST:

- BLOOD
- PANCREAS
- LIVER
- INSULIN
- GLUCAGON
- GLUCOSE
- AMINO ACIDS

Diabetes Around the World

The world map shows the number of people at risk of the world that has the highest number of people with Type 2 Diabetes.

Number of adults with type 2 diabetes around the world in 2013:

Region	Number of adults (Millions)
South-East Asia (SEA)	56M
Region of the Americas	72M
Europe	138M
World Total	392M

Region of the world with the highest number of people with Type 2 Diabetes:

Region	Number of people with Type 2 Diabetes (Millions)
Region of the Americas	~138M

Developing Engaged Citizens

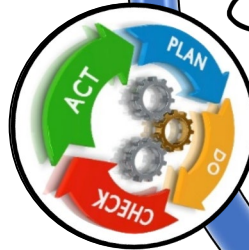
Access to information



Opportunities for discourse and learning



Opportunities for evaluation and testing of potential actions



Freedom to decide



Healthy Start to Life

A Context for 21st Century Education

The fetal and infant origins of adult disease.

The womb may be more important than the home

Prof David JP Barker BMJ 1990



Transgenerational Opportunity:

Adolescence – before the horse has bolted!

- Adolescence is a determining point for nutritional, physical activity and cognitive behaviors that persist into adulthood and influence future health.
- Consequently these behaviors will influence periconceptual environmental exposures, as well as health prior to conception.
- Even if pregnancy is a considerable distance from adolescence, behaviors that develop during adolescence contribute towards later-life NCD vulnerability in offspring.
- Thus, adolescence is a life-stage offering significant potential for transgenerational primary prevention of obesity and NCD risk.
- **Cook Islands - 40% mothers giving birth are age 15-24 years**

Policy and Practice Impacts



Commission on Ending Childhood Obesity

- [Commission on Ending Childhood Obesity \(ECHO\)](#)
- [About the work of the Commission](#)
- [Working Groups](#)
- [Information resources](#)

Commissioners hear from young people about preventing childhood obesity



WHO/C. Dewan

28 July 2015 - Auckland, New Zealand. The Commissioners visited Tamaki College secondary school in Auckland, to hear from young people, as part of the regional consultation with Pacific Island Countries and Territories. The students, many from Pacific Island communities, told the Commissioners that overweight, obesity and type-2 diabetes are very common in their community and serious health concerns for many of their families. They discussed what actions they felt need to be taken to tackle this issue.

[Read the full story](#)

Highlights	Draft Final Report of the Commission open for comment	Commissioners hear from young people about preventing childhood obesity	Commission consults with the Eastern Mediterranean
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Multisectoral Partnerships: *Must recognise and respect sector-specific vision*

A world free of the avoidable burden of NCDs

Improving nutrition and associated factors in childhood and adolescence, supporting transgenerational NCD risk reduction.

Empowering adolescents as lifelong learners capable of engaging in current and future issues; negotiating ethical dilemmas, conflicting evidence, and application of evidence within the frame of social and cultural values.

Development of capabilities empowering adolescents to participate as critically engaged citizens, using evidence-based health-promoting actions to facilitate reduction in NCD risk for themselves, their potential future offspring, and their families, and contribute towards reducing negative social and economic impacts of NCDs in their communities.

World Health Organization. Global action plan for the prevention and control of noncommunicable diseases 2013-2020. 2013.

World Health Organization. Draft final report of the commission on ending childhood obesity; World Health Organization: Geneva, Switzerland, 2015.

United Nations General Assembly. Political declaration of the high-level meeting of the general assembly on the prevention and control of non-communicable diseases. United Nations: New York, 2011.

Hipkins, R.; Bolstad, R.; Boyd, S.; McDowall, S. Key competencies for the future. NZCER Press: New Zealand, 2014.

The Education Challenge: Critical Engaged Citizenship

Enabling the potential of adolescents as lifelong engaged citizens

Context: Personal, Social and Environmental

Self-Efficacy

Engagement

Cognitive and psychosocial **capability** development

Transformative **Learning**

Informed Decision-Making

Actions leading to improved long-term health and wellbeing

Key Competencies for Engaged Citizenship

Health Literacy

Scientific Literacy



Capabilities for critical, informed and responsible citizenship

Requires people to

Context

Complex life situations that involve the interaction of science, technology and sociology

Competencies

- Identify issues
- Access information
- Explain phenomena
- Debate options
- Use evidence in decision making
- Communication ideas

Knowledge of and about

- The natural world
- Science and technology
- Culture and religion
- Sociology and politics
- Economics
- Health and Wellbeing

How they do this is influenced by

Attitudes

- Response to societal issues
- Interest
 - Support for inquiry
 - Responsibility

Interrelated aspects of Competencies for Citizenship
Adapted from OECD (2006)

Student Voice Evidence:

Data access is important

“When we did the programme I was really surprised by how much people there are that are suffering from diabetes and obesity - because it does not seem like much to us but when we saw the data it was a lot which was really surprising. I am glad we did the topic because now we know and now we can try and make a difference”.

Student A, - Year 11

“I didn’t notice how serious it [obesity, diabetes, heart disease] is until I saw the data. Now we have learnt about why and about things we can do to prevent diabetes, we can make decisions”

Student B, Year 11

Was seeing the data important for anyone else?

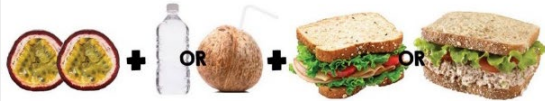
“Like really glad [to see the data] - it was really important. I am glad we saw it because if we did not we would not know about the issue. If we did not study that topic we would not know about the issue that has been happening in plain sight but we don’t really see it. If we had not seen this we would not know about how diabetes is affecting our population.”

Student C, Year 11

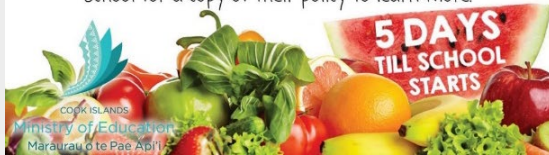
A HEALTHY CHILD MAKES A SUCCESSFUL LEARNER

A growing child needs lots of nutrition to feed the brain and the body so he/she can stay active, motivated, and inspired to learn throughout the day. Make lunch times fun by cutting sandwiches and fruits into fun shapes. Keep food small and manageable and avoid junk food.

Here are some ideas for healthy school lunches.



All schools have Healthy Food Policies so ask your child's school for a copy of their policy to learn more.



A Glimpse at Impacts....

“My family didn’t believe when I said that we were number 1 [for obesity] - because I think my Dad still believes that Cook Islanders are still all fit -. so you have to show them the data

They were surprised because they did not know about this because back in their time there were no problems with weight. After like I explained this to them they too agreed because one of my parents said they saw one of their friends from when they kids already has diabetes - and so we were like talking about how it is real and that we all need to change and eat more veges and do more exercise.

So like we have been talking about that quite a lot in our house and we are eating more vegetables for our dinners”.



Student E, Year 11

Capacity building for Nurses - Research

- **Encourage Pacific Nurses to be involved in Research - NCD**
- **Provide evidence – Policy & Program Dev.**
- **2017 - 4 Female Postgraduate students - Liggins Inst. UOA**
- **2 Tongans, 1 PhD and 1 Masters – eligible for PhD program**
- **2 Cook Islanders with Masters – both eligible for PHD**
- **Scholarships - Funding thru NZHRCouncil & UOA**

PACIFIC SCIENCE FOR HEALTH LITERACY PROJECT

Acknowledgements:

The project team acknowledge and thank all students, parents, families and teachers and school support staff who are contributing to the project.

Project partners – Cook Islands:

- Nukutere College
- Tereora College
- Titikaveka College
- Ministry of Health
- Ministry of Education
- Liggins Institute

Funding: NZ Aid Partnership Programme

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- Tania Avare
- Dr. Jacquie Bay -(Liggins)
- Jane Duffy
- Heimata Herman
- Prof. Mark Vickers

A tropical beach scene with white sand, turquoise water, and a dense line of palm trees under a blue sky. The text "Maata and Kia Manuia" is overlaid on the left side of the image.

Maata
and
Kia Manuia

The Education Challenge: Critical Engaged Citizenship

Enabling the potential of adolescents as lifelong engaged citizens

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Cognitive and
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Transformative
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**Informed
Decision-
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Actions
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The Challenge: *Translation of DOHaD evidence to support transgenerational NCD risk reduction*

Lifecourse view of noncommunicable disease (NCD) risk.

