Sustainable Health Care for a Sustainable Planet

A/Prof Grant Blashki
Providing refuge to the Sisters of St Joseph and Saint Mary MacKillop
Health is the greatest possession. Contentment is the greatest treasure. Confidence is the greatest friend.

*Lao Tzu*
You are the bows from which your children as living arrows are sent forth.

*Khalil Gibran*
All that I am, or hope to be, I owe to my angel mother.

Abraham Lincoln
The world has been very careful to pick very few diseases for eradication, because it is very tough.

*Bill Gates*
Health expenditure is not equal globally!

Total expenditure on health per capita, 2007 *
(in US$)

* Based on data updated in March 2010.

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.
Modern Medicine uses a lot of energy, water and materials.
Health care is resource intensive
Global and Green Healthy Hospitals

NHS in England
25% of total public sector emissions
18 MILLION tons of CO2 each year

Brazil Healthcare Sector
10% of total country energy consumption

China
$10 BILLION PER YEAR expenditure on health care construction

A Comprehensive Environmental Health Agenda for Hospitals and Health Systems Around the World

www.noharm.org
www.greenhospitals.net
Catholic Earthcare Australia

• The ecological agency of the Catholic Church
• Established in 2002 to bring about ecological conversion
• An invitation to register your interest in the National Energy Efficiency Not-for-profit Network (NEENN)
• earthcare@catholic.org.au Jacqui Remond
• www.catholicearthcare.org.au
“Health professionals are trusted by society worldwide. They must honor the trust covenant they have with those they serve by advocating for policies and practices that will help to mitigate and adapt to climate change.”
The GREEN and CLEAN hospitals program in Thailand, run by the Department of Health Promotion, sets a series of benchmarks for hundreds of health facilities to address their energy use, chemical consumption, food use, waste production and more.

Indonesia’s Ministry of Environment has recently added hospitals to its PROPER program, an environmental performance rating system introduced by the Ministry of Environment in the 1990’s to improve industry’s environmental performance.

The National Health Service in England has created a “Route Map” for greening its hospitals.

The Health Promoting Hospitals Network, originating in Europe with support from the World Health Organization (WHO), is developing a set of sustainability criteria.

In the US, the NGO Practice Greenhealth has more than 1,000 hospital members that are working to decrease their environmental footprint.

A number of global corporations are competing to build and operate “green hospitals” around the world. Initiatives and conferences on greening the health sector are emerging in countries as diverse as Argentina, Brazil, China, India, the Philippines, South Africa.

Source: Global Green and Healthy Hospitals Program
GreenClinic
ACTION FOR A BETTER WORLD

THE GREENCLINIC GUIDE

GreenClinic assists doctors and practice managers to identify simple changes to make in clinics that will save energy and water, reduce waste, and help patients and communities to live more sustainable and healthy lives.

www.acfonline.org.au/greenclinck

TOP TIPS FOR GR

1. INSTALL LOW-ENERGY LIGHTING
   - Replacing one incandescent globe with a compact fluorescent light can save 500 kg of greenhouse pollution and save you $70 in energy costs in its lifetime (about 6 years).
   - How to:
     - Swtich off all lights out of hours.

2. BUY GREEN POWER FOR THE CLINIC
   - Ask your energy supplier (or a new one) to switch you to accredited Green Power.
   - Buying 100% accredited Green Power means all your electricity will come from new wind, solar or other renewable energy sources and you are supporting the growth of this industry.
   - How to:
     - Visit www.greenpower.gov.au for electricity retailers that offer Green Power. Check www.greenelectricitywatch.org.au for a report card of all the products on offer assessed by ACF and other environment groups.
     - Ensure you choose a Green Power product that is accredited with this scheme - there are some electricity retailers selling “green electricity” products that are not accredited and are not sourced from new renewable energy.

3. TURN OFF COMPUTERS AND APPLIANCES TO SAVE ENERGY
   - Leaving the photocopier, fax, television and laser printer all on standby for eight hours each day will produce over 370 kilograms of greenhouse pollution per year.
   - How to:
     - Turn off computers and screens when not in use. (Replace the star rating and choose the one that uses the least energy per year.
     - Turn off standby power at the end of each day.
     - Turn off heating and cooling at night.
     - Set your fridge so it has an air space around it to keep the heat it generates (especially behind and above it) away from the sun.
     - Ensure the coils at the back of the fridge are clean.
     - You can save up to 300 kg of greenhouse pollution per year by doing the simple steps listed above.
     - How to:
       - Visit www.energyrating.gov.au for a comprehensive list of energy efficient refrigerators and their star rating.
       - Contact a refrigeration service person to check the state of your seals and coils.
How we make GREEN HOSPITALS

PhD thesis
“Hospitals and Environmental Sustainability”

Sustainable hospitals? An Australian perspective.

McGain F.

Mandating sustainability in Australian hospitals
Forbes McGain, Grant A Blashki, Kevin P Moon and Fiona M Armstrong

TO THE EDITOR: Climate change has an adverse impact on health.¹ Procurement, waste production, transport, and energy and water consumption (ie, the ecological “footprint”) all contribute to climate change. If the principle underpinning the work of all health professionals is “do no harm”, addressing the harmful effects of the health care industry on the natural environment must become a priority. We argue that one

The financial and environmental costs of reusable and single-use plastic anaesthetic drug trays

F. McGAIN*, S. McALISTER†, A. McGAVIN‡, D. STORY§
Department of Anaesthetics and Intensive Care, Western Hospital, Melbourne, Victoria, Australia
Easy in Health to think “Not our Problem!”
No man is an island, entire of itself
John Donne (1572-1631)
"For too long we have tried to consume our way to prosperity. Look at the cost: polluted lands and ocean, climate change, growing scarcity of resources from food to land to fresh water, rampant inequality."

"Nature has been kind to human beings, but we have not been kind to nature."
“Science basically says that we are on the threshold of starting to do real damage to the world, and if I run my models a little further in 2080, the temperature will be +3 degrees Centigrade over pre-industrial times and that in my mind is enough to trigger self-reinforcing climate change, basically melting of the tundra which then emits a lot of methane, which makes things much much warmer.

So in many ways it’s a sad story, the next 40 years, because it’s a story of humanity not rising to the occasion.”
Business leaders have been asking for clarity in political ambition on climate change. Now one thing is clear: businesses, governments and communities across the world need to plan for a warming world – not just 2°C, but 4°C, or even 6°C.

Leo Johnson
Partner, Sustainability and Climate Change, PwC
Concentrations of Main Greenhouse Gases over Past 2,000 Years (IPCC 2007)

Carbon Dioxide (CO$_2$)
Nitrous Oxide (N$_2$O)
Methane (CH$_4$)

Year
Concentrations of Main Greenhouse Gases over Past 2,000 Years (IPCC 2007)

- **Carbon Dioxide (CO₂)**
- **Nitrous Oxide (N₂O)**
- **Methane (CH₄)**

### Yearly Concentrations

- **Carbon Dioxide (CO₂)**: ppm
- **Nitrous Oxide (N₂O)**: ppb
- **Methane (CH₄)**: ppb

### Key Observations
- Peak concentrations of CO₂, N₂O, and CH₄ are observed in the last 200 years.
- CO₂ now: 415 ppm (2015)
- N₂O: 290 ppb (2015)
- CH₄: 1800 ppb (2015)

### Time Frame
- Year range: 0 - 2000

### Graph Highlights
- The rapid increase in CO₂ concentration is particularly noticeable in the last century, mirroring global industrial growth.
- N₂O and CH₄ concentrations have also seen significant increases, contributing to the overall greenhouse effect.
Changes in average temperature for Australia for each year (orange line) and each decade (grey boxes), and 11-year average (black line – an 11-year period is the standard used by the Intergovernmental Panel on Climate Change). Anomalies are the departure from the 1961-1990 average climatological period. The average value for the most recent 10-year period (2002–2011) is shown in darker grey.
Human Activities Are Very Likely The Cause of Rising Greenhouse Gases and Rising Global Temperature IPCC

Huagpu River in Shanghai – Coal Barge Procession
Increase in annual-average daily mean temperature from 1960 to 2011 (in °C). Most of Australia has experienced warming over the past 50 years, with some areas experiencing warming since 1960 of up to 1 °C.

Source: Bureau of Meteorology
IPCC Global Temperatures

FAQ 9.2, Figure 1. Temperature changes relative to the corresponding average for 1901-1950 (°C) from decade to decade from 1906 to 2005 over the Earth’s continents, as well as the entire globe, global land area and the global ocean (lower graphs). The black line indicates observed temperature change, while the coloured bands show the combined range covered by 90% of recent model simulations. Red indicates simulations that include natural and human factors, while blue indicates simulations that include only natural factors. Dashed black lines indicate decades and continental regions for which there are substantially fewer observations. Detailed descriptions of this figure and the methodology used in its production are given in the Supplementary Material, Appendix 9.C.
Some key recent reports
Climate Change and Health: The Critical Decade. The Climate Commission
## Predicted Rises in Number of Hot Days

**Projected number of days over 35°C in Australian capital cities.**

<table>
<thead>
<tr>
<th>City</th>
<th>2008</th>
<th>2030</th>
<th>2070</th>
<th>2100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melbourne</td>
<td>9</td>
<td>12</td>
<td>21</td>
<td>27</td>
</tr>
<tr>
<td>Sydney</td>
<td>3.3</td>
<td>4.4</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0.9</td>
<td>1.7</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>Adelaide</td>
<td>17</td>
<td>22</td>
<td>34</td>
<td>44</td>
</tr>
<tr>
<td>Perth</td>
<td>27</td>
<td>35</td>
<td>56</td>
<td>72</td>
</tr>
<tr>
<td>Canberra</td>
<td>5</td>
<td>8</td>
<td>21</td>
<td>32</td>
</tr>
<tr>
<td>Darwin</td>
<td>9</td>
<td>36</td>
<td>221</td>
<td>312</td>
</tr>
<tr>
<td>Hobart</td>
<td>1.4</td>
<td>1.7</td>
<td>2.5</td>
<td>3.4</td>
</tr>
</tbody>
</table>
Victoria, Jan 2009: Heatwave, Illness Events, Deaths

27-31 January – maximum temperatures 12-15°C above normal. > 43°C during 28-30 Jan

126 out-of-hospital deaths (vs. 44 expected deaths)

60% increase, Jan 29-30, in ambulance call-outs

**Ambulance attendances for heat-related illnesses in Metropolitan Melbourne: 19 Jan – 1 Feb, 2009**

**SOURCE:** January 2009 Heatwave in Victoria: an Assessment of Health Impacts. *State of Victoria 2009*
Mean Daily Land Surface Temperature (LST) in the Melbourne Metropolitan Area by 2006 Postcode Area

Illustration of ‘Heat Island” Effect
Melbourne, Australia
Heatwave, Jan 2009

From: M Loughnan, Monash University
Urban Heat Island

From The Critical Decade Climate Change and Health 2011
Air Quality and Climate Change

- Ground level ozone
- Aeroallegens
- Dust storms
- Bushfires
- Particulates

- Children
- Elderly
- Pre-existing cardio respiratory disease
- Outdoor occupation/recreation
Floods
Climate Change and Sea Level Rise
Climate Change and Sea Level Rise

**Rising global mean sea level**

**Key Points**
- The rate of sea level rise increased during the 20th century.
- During 1993 to 2009, sea level rise has been 1.5 to 3 mm per year in the south and east of Australia and 7 to 10 mm per year in the north and west.
Dengue Fever: Estimated ‘receptive’ region for Ae. aegypti mosquito vector, under alternative climate-change scenarios for 2050

Current risk region for dengue transmission

Risk region for medium emissions scenario, 2050

Risk region for high emissions scenario, 2050

NCEPH/CSIRO/BoM/UnivOtago, 2003
Climate Change and Malaria
Potential transmission in Zimbabwe

Climate suitability:
red = high; blue/green = low

- **Low probability**
  - 0.01 - 0.05
  - 0.05 - 0.1
  - 0.2 - 0.25
  - 0.25 - 0.3
  - 0.3 - 0.35
  - 0.35 - 0.4
  - 0.4 - 0.45
  - 0.5 - 0.6

- **Medium probability**
  - 0.6 - 0.65
  - 0.65 - 0.7
  - 0.7 - 0.75
  - 0.75 - 0.8
  - 0.8 - 0.85
  - 0.85 - 0.9

- **High probability**
  - 0.9 - 0.99
  - 0.99 - 1

No Data

Ebi et al., 2005
Climate Change and Malaria
Potential transmission in Zimbabwe

Climate suitability:
red = high; blue/green = low

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0.01 - 0.05
0.05 - 0.1
0.1 - 0.15
0.15 - 0.2
0.2 - 0.25
0.25 - 0.3
0.3 - 0.35
0.35 - 0.4
0.4 - 0.45
0.45 - 0.5
0.5 - 0.55
0.55 - 0.6
0.6 - 0.65
0.65 - 0.7
0.7 - 0.75
0.75 - 0.8
0.8 - 0.85
0.85 - 0.9
0.9 - 0.95
0.95 - 0.99
0.99 - 1
No Data

Bulawayo
Harare

Baseline 2000 2025 2050

Ebi et al., 2005
### Modelled range of climate change impacts on global cereal grain production:

**Percent change, 1990-to-2080**

<table>
<thead>
<tr>
<th>Region</th>
<th>Range (% change)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>World</strong></td>
<td>-0.6 to -0.9</td>
</tr>
<tr>
<td>Developed countries</td>
<td>+2.7 to +9.0</td>
</tr>
<tr>
<td>Developing countries</td>
<td>-3.3 to -7.2</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>-2.5 to -7.8</td>
</tr>
<tr>
<td>South Asia</td>
<td>-18.2 to -22.1</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>-3.9 to -7.5</td>
</tr>
<tr>
<td>Latin America</td>
<td>+5.2 to +12.5</td>
</tr>
</tbody>
</table>

From: Tubiello & Fischer, 2007
Climate Change amplifies existing Global Health Problems
Deaths Attributable to Climate Change: Year 2000


Estimated annual deaths due to climate change from: malnutrition (~80K), diarrhoea (~50K), malaria (~20K), flooding (~3K)
"Nothing great was ever achieved without enthusiasm"

Ralph Waldo Emerson (1803-1882)
B E F O R E  I T  I S  T O O  L A T E,

It is necessary to make courageous decisions that reflect knowing how to re-create a strong alliance between man and the Earth. A decisive “yes” to the protection of creation is necessary, and a firm commitment to reverse those tendencies that run the risk of bringing about situations of unstoppable degradation.
On climate change,

**IT IS NOW TIME TO ACT,**

with clear purpose, creativity, care and compassion,

especially for our sisters and brothers who will

suffer the most from past neglect and, if we turn

our back, our future indifference.
"We cannot solve our problems with the same thinking we used when we created them.”
Albert Einstein (1879-1955)
Preparing our Health Services for Climate Change
Adaptation

Preparing Health Services for Climate Change in Australia

Grant Blashki, MD, FRACGP¹, Greg Armstrong, MSP, BSW¹, Helen Louise Berry, PhD², Haylee J. Weaver, PhD, BSc³, Elizabeth G. Hanna, PhD, MPH³, Peng Bi, MBBS, PhD⁴, David Harley, MBBS, PhD³, and Jeffery Thomas Spickett, BSc(Hons), PhD⁵
**Work with Patients**

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**SUSTAINABILITY PRESCRIPTION**
recommended actions to improve your health

<table>
<thead>
<tr>
<th>Tick</th>
<th>Recommended actions</th>
<th>How often?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>Switch from driving to walking or cycling</td>
<td>Walk or cycle two trips per week instead of driving (try to get at least 30 minutes of exercise per day - to these two trips contribute to this)</td>
</tr>
<tr>
<td>☐</td>
<td>Switch to public transport - walk to/from your stop or get off early and walk the rest of the way</td>
<td>Take public transport two return trips per week walking 15 minutes each way (30 minutes total) instead of driving</td>
</tr>
<tr>
<td>☐</td>
<td>Limit the amount of red meat in your diet to a maximum of 60g per day - eat more vegetables and non-meat protein (especially avoid processed meats)</td>
<td>Replace red meat in your meals with alternatives twice a week</td>
</tr>
<tr>
<td>☐</td>
<td>Limit the amount of dairy food in your diet to 2-4 serves per day</td>
<td>Reduce dairy consumption by four servings per week (a serve equals one cup of milk or equivalent quantity of cheese, yoghurt, etc.)</td>
</tr>
<tr>
<td>☐</td>
<td>Drink more water from the tap (not bottled)</td>
<td>Ensure you drink at least 1250-1750ml of water per day for optimum health</td>
</tr>
<tr>
<td>☐</td>
<td>Quit smoking</td>
<td>Reduce cigarettes smoked per day gradually down to zero (or go cold turkey)</td>
</tr>
<tr>
<td>☐</td>
<td>Insulate and shade your home to be cooler in hot weather and warmer in winter</td>
<td>When possible, install ceiling and wall insulation, exterior blinds and interior curtains</td>
</tr>
<tr>
<td>☐</td>
<td>Eat locally grown, fresh fruit and vegetables</td>
<td>Buy and consume 10% more fruit and vegetables grown in your local region</td>
</tr>
<tr>
<td>☐</td>
<td>Grow your own vegetables or fruit</td>
<td>Plant herbs, vegetables or fruit and get into the garden daily to tend them (watering, pest protection, harvesting etc.)</td>
</tr>
<tr>
<td>☐</td>
<td>Spend more time outdoors in nature</td>
<td>Walk to a park, river, bushland or beach three extra times per week</td>
</tr>
</tbody>
</table>

See the benefits of each recommended action overleaf.
The NCD Challenge

(For non medicos NCD’s = Non Communicable Diseases)

- Cardiovascular Disease
- Chronic Pulmonary Diseases
- Obesity Related Conditions
- Diabetes
- Chronic Musculoskeletal Diseases
Transform Transport Policy

- Fossil Fuel
- Human Fuel
Transform Food Policy

- Food and agriculture contribute 10-12% of greenhouse gases.

- A 30% reduction in animal product consumption could lead to a 15% reduction in burden of cardio-vascular disease (in high consuming countries).

Haines A How the low Carbon economy can improve health 2012 BMJ
In India, 90,000 premature deaths could be avoided annually as a result of reduced atmospheric fine particles from coal production. Haines 2012 BMJ
Stabilise population

**POPULATION OF THE EARTH**

Number of people living worldwide since 1700 in billions

- 1804: 1 bln
- 1927: 2 bln
- 1960: 3 bln
- 1974: 4 bln
- 1999: 6 bln
- 2012: 7 bln
- 2024: 8 bln
- 2048: 9 bln

Source: United Nations World Population Prospects, Deutsche Stiftung Weltbevölkerung

For further information please visit: www.knowledge.allianz.com
Australian business leaders support sustainability reporting: over 95 percent of respondents say committing to sustainability yields benefits for organizations.

Dr George Beaton, Executive Chairman of Beaton Research and Consulting and Executive Director of WellmarkPerspexa, says "Our results demonstrate the huge latent potential for sustainability reporting in Australia – the will is there, but a substantial proportion of organisations are yet to find the way."

Professor Rob Moodie, the inaugural Chair of Global Health, Nossal Institute for Global Health, said sustainable business was integral to a healthy planet and to healthy people.
How we DESIGN OUR CITIES


**HEALTHY CLIMATE, PLANET & PEOPLE**

**Co-Benefits for Health from Action on Climate Change**

2010 Fenner Conference
The Shine Dome, Canberra

**Professor Tony Capon**
Design Green Hospitals
10 Goals

THE TEN GOALS

1. LEADERSHIP
   Prioritize Environmental Health

2. CHEMICALS
   Substitute Harmful Chemicals with Safer Alternatives

3. WASTE
   Reduce, Treat and Safely Dispose of Healthcare Waste

4. ENERGY
   Implement Energy Efficiency and Clean, Renewable Energy Generation

5. WATER
   Reduce Hospital Water Consumption and Supply Potable Water

6. TRANSPORTATION
   Improve Transportation Strategies for Patients and Staff

7. FOOD
   Purchase and Serve Sustainably Grown, Healthy Food

8. PHARMACEUTICALS
   Safely Manage and Dispose of Pharmaceuticals

9. BUILDINGS
   Support Green and Healthy Hospital Design and Construction

10. PURCHASING
    Buy Safer and More Sustainable Products and Materials