Our publicly funded healthcare system

Is it sustainable?

Alastair Macdonald
Retired renal physician
Current clinical ethics advisor

U3A-Wellington

25.10.19

CONSILIENCE

Agreement between the approaches to a topic of different academic subjects, especially science and the humanities.

William Whewell 1840

Talk outline

- **History of N.Z. health system**
- The changing concept of autonomy
- Health reforms
- Social determinants of health
- The complexity of health care
- Stewardship
- Non-beneficial health interventions
- Pigeons
- Artificial intelligence
- Autonomy algorithm

Kurow
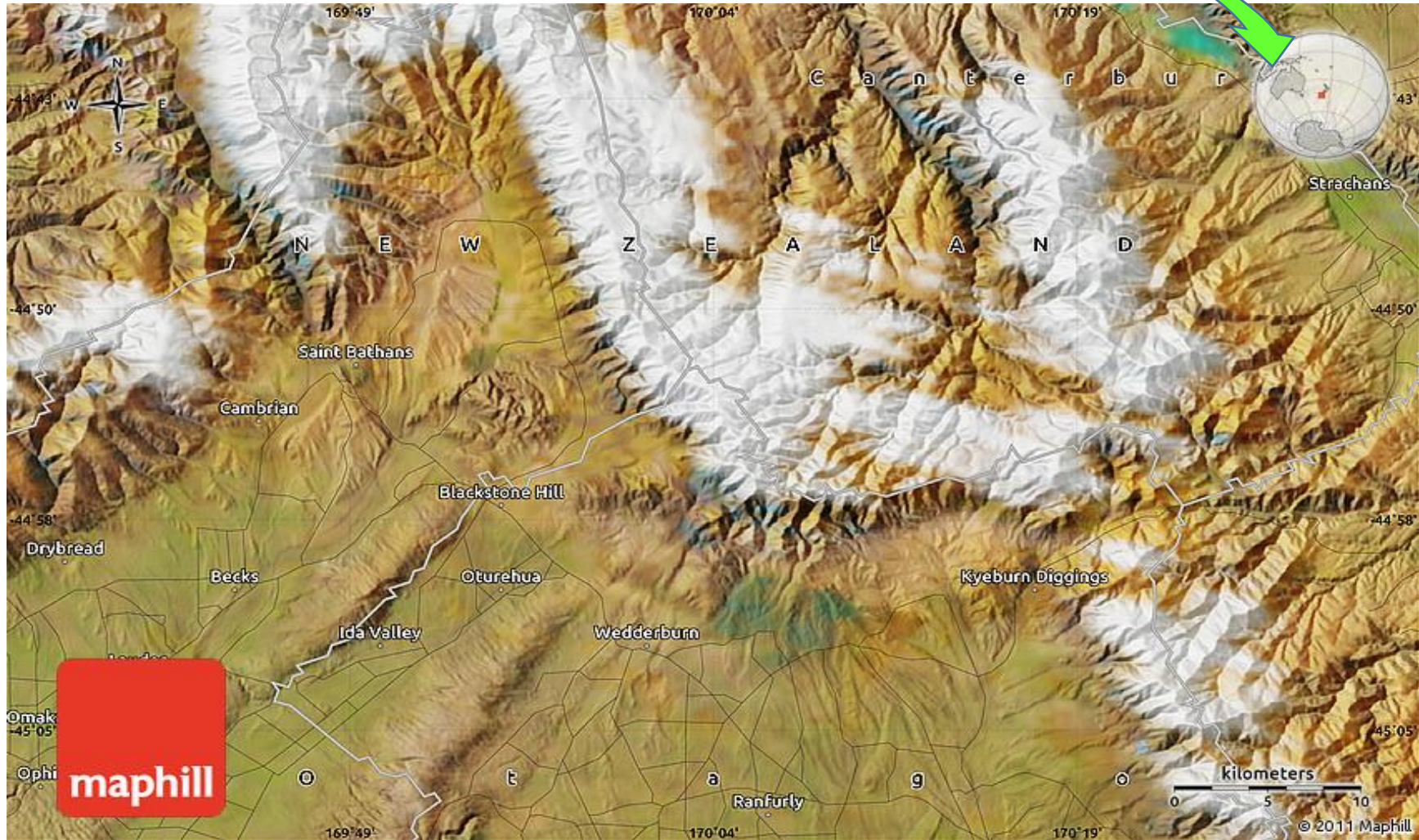
"Three wise men of Kurow"

- Andrew Davidson - Teacher
- Dr. Gervan McMillan - Doctor
- Arnold Nordmeyer – Minister

Artist Bob Kerr

"Three wise men of Kurow"

- Andrew Davidson - Teacher
- Dr. Gervan McMillan - Doctor
- Arnold Nordmeyer – Minister

"We were fired with a fervent desire to create a new society"

Artist Bob Kerr

"a national health scheme"

It must

- Be free

- Be complete

- Meet the needs of all the people

Artist Bob Kerr

New Zealand's proud history

- 1938 Social Security Act

- A public health system…

- *"The standard of advice and skill should be the same for all patients, regardless of their social status or income"*

  - Autonomy
  - Utilitarianism
  - Justice
  - Beneficence
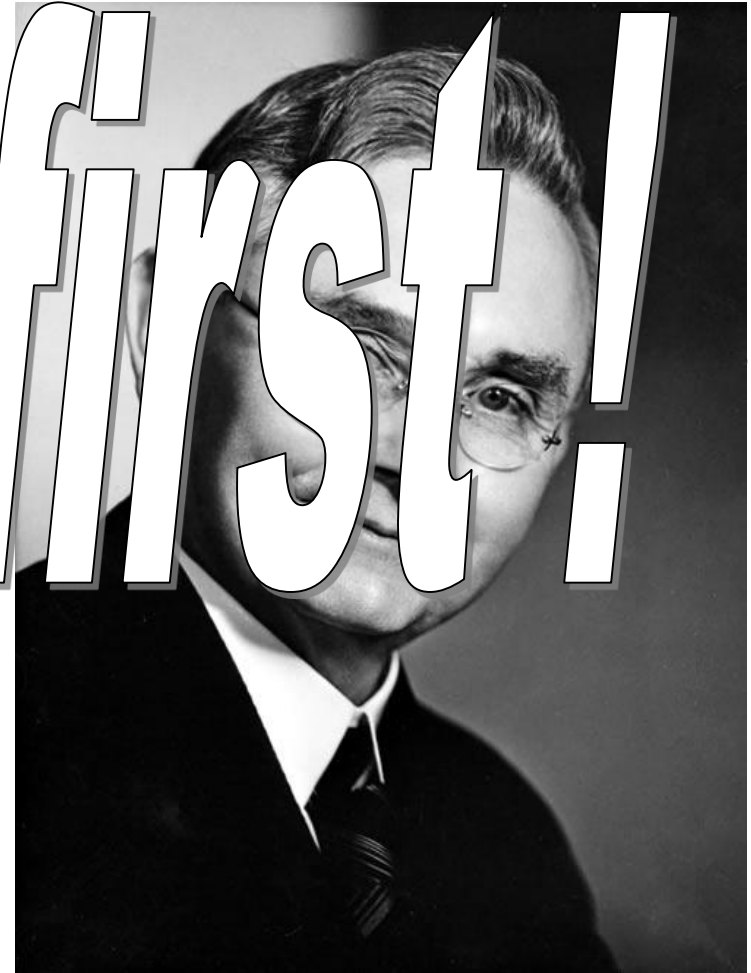 - Virtue ethics

New Zealand's proud history

- 1938 Social Security Act

- A public health system

- "The standard of a society should be the same social standard income

  - Autonomy
  - Utilitarianism
  - Justice
  - Beneficence
  - Virtue ethics

A world first!

Talk outline

- History of N.Z. health system
- **The changing concept of autonomy**
- Health reforms
- Social determinants of health
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- Non-beneficial health interventions
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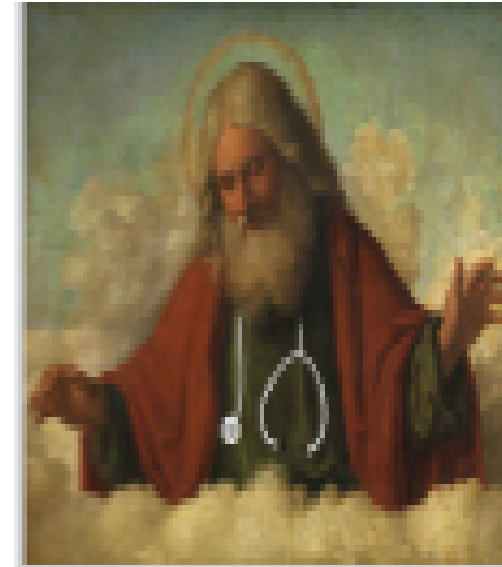- Artificial intelligence
- Autonomy algorithm

The evolution of autonomy

1940-1962

Traditional model of care:

· Doctor leads the team

· Doctor/patient relationship is fundamental.

The evolution of autonomy

"Sixties"

→

"Love me do" (1962)

The evolution of autonomy

"Sixties"
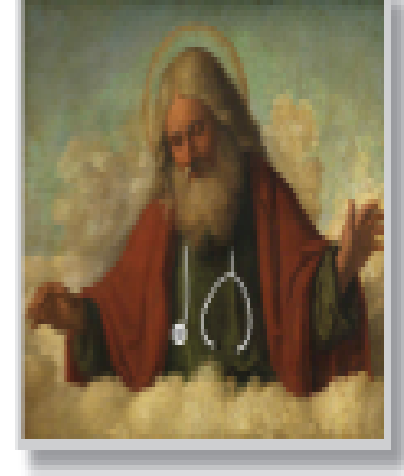
→

"Love me do"

Woodstock
Hippies

"Turn on
Tune in
Drop out"

The evolution of autonomy

"Love me do"
Woodstock
Hippies

"Turn on
Tune in
Drop out"

The doctor – patient relationship

Based on paternalism

Doctor knows best!!

1976

ECONOMIC ASPECTS OF THE COMMISSION FOR

THE FUTURE'S SCENARIOS OF 2010

By: Bryan Philpott,
      Adolf Stroombergen,
and Stephen Burnell.

ECONOMIC ASPECTS OF THE COMMISSION FOR

THE FUTURE'S SCENARIOS OF 2010

By: Bryan Philpott,
      Adolf Stroombergen,
and Stephen Burnell.

OCCASIONAL PAPER No.45   FEB. 1981.

Didn't have much of a future !!

Talk outline

- History of N.Z. health system
- The changing concept of autonomy
- "Health reforms" (Euphemism!!)
- Social determinants of health
- The complexity of health care
- Stewardship
- Non-beneficial health interventions
- Pigeons
- Artificial intelligence
- Autonomy algorithm

Ideas

- Values

- Visionary

- **Dystopian thinking and language**

"Consultation" in New Zealand Health

"The individual's knowledge of the health services market can never be complete, and his/her ability to make rational decisions about how much or what type of services they should purchase and plan for can only be minimal"

Alan Gibbs 1988 "Unshackling the Hospitals"

"Consultation" in New Zealand Health

"The individual's knowledge of the health services market can never be complete, and his/her ability to make rational decisions about how much or what type of services they should purchase and plan for can only be minimal"

Alan Gibbs 1988 "Unshackling the Hospitals"

A new language !!

- Infection rates are "commercially sensitive"

- R.G.U. = Patient

- Cost Centre = patient

- Intermediate product = a procedure

- Hospital = CHE

- Hospital charges 1992-3 !!

- Purchaser / Provider splits

- CCMAU- (Crown Company Monitoring and Advisory Unit)

- "Internal colonisation" **

** "Italian fascist regime's use of internal colonisation as part of a wider ruralisation policy aimed at promoting population growth"

A new language !!

- Infection rates are "commercially sensitive"

- R.G.U. = Patient

- Cost Centre = patient

- Intermediate product = a procedure

- Hospital = CHE

- Hospital charges 1992-3 !!

- Purchaser / Provider splits

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- "Internal colonisation"

Rogernomics
Ruthanasia
Jennycide
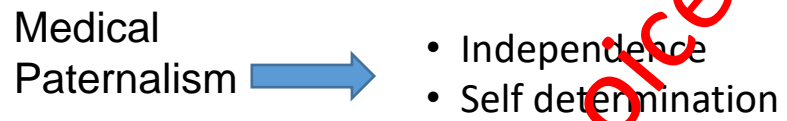
The evolution of autonomy

"Sixties"   "Nineties"

→

Medical
Paternalism →
- Independence
- Self determination

The evolution of autonomy

"Sixties"   "Nineties"

Medical
Paternalism →
- Independence
- Self determination

Choice

The evolution of autonomy

"Sixties"   "Nineties"

Medical
Paternalism
- Independence
- Self determination

Choice

- Atomistic,
- Too abstract
- Unrealistic expectations

The evolution of autonomy

"Sixties"   "Nineties"

→

- Aging
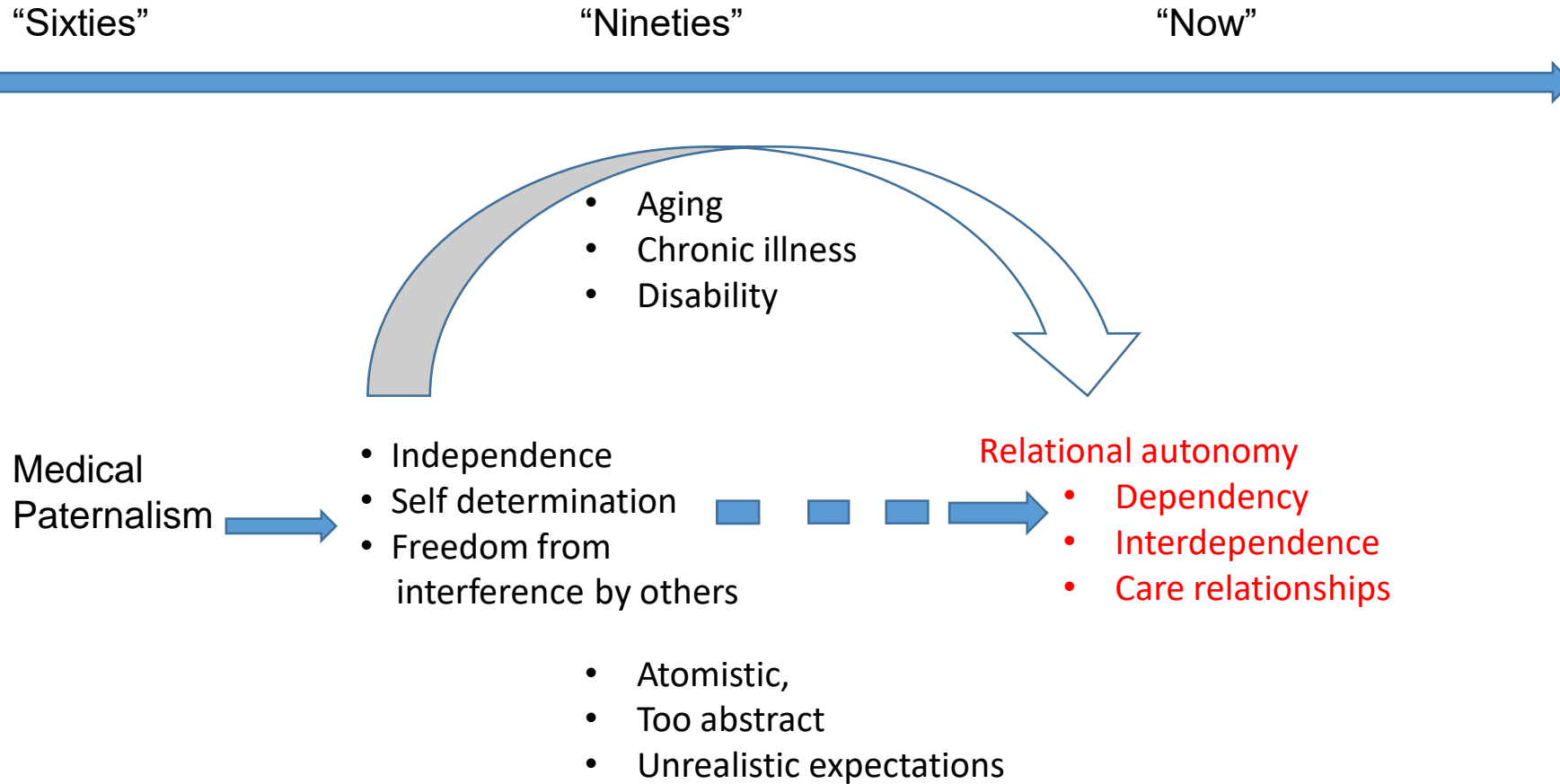- Chronic illness
- Disability

Medical
Paternalism →
- Independence
- Self determination
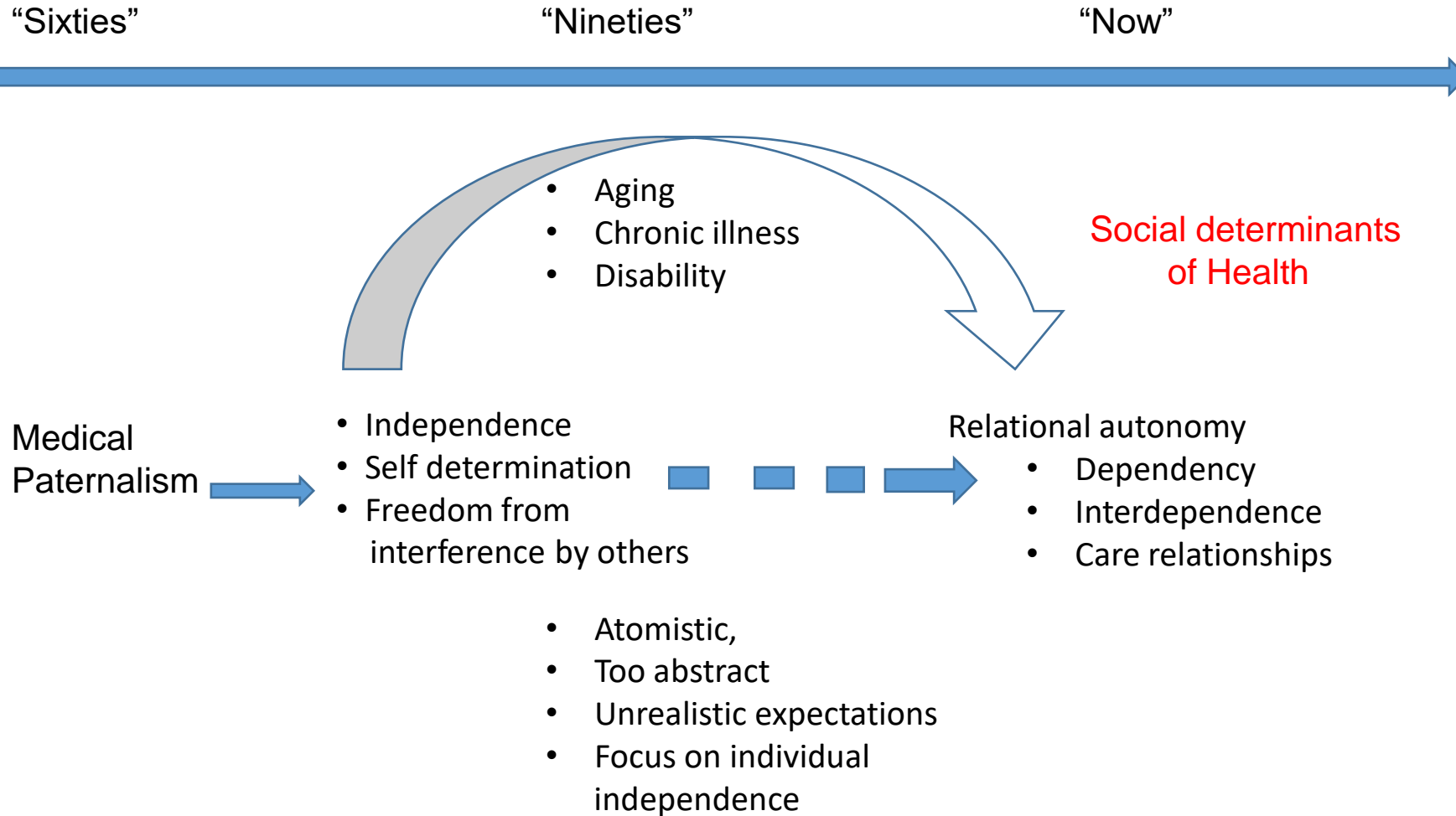
Choice

The evolution of autonomy

"Sixties" "Nineties" "Now"

- Aging
- Chronic illness
- Disability

Medical
Paternalism

- Independence
- Self determination
- Freedom from
  interference by others

Relational autonomy
- Dependency
- Interdependence
- Care relationships

- Atomistic,
- Too abstract
- Unrealistic expectations

Talk outline

- History of N.Z. health system
- The changing concept of autonomy
- "Health reforms"
- Social determinants of health
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The evolution of autonomy

"Sixties"   "Nineties"   "Now"

- Aging
- Chronic illness
- Disability

Social determinants of Health

Medical Paternalism

- Independence
- Self determination
- Freedom from interference by others

Relational autonomy

- Dependency
- Interdependence
- Care relationships

- Atomistic,
- Too abstract
- Unrealistic expectations
- Focus on individual independence

WEALTH-GAP TOWER

THE VIEW IS GREAT (FOR THOSE AT THE TOP)

OK, IMAGINE ALL THE WEALTH IN NZ— ALL THE SAVINGS, HOUSES, ASSETS—COMBINED TOGETHER INTO ONE TEN STORY BUILDING WE ALL LIVE IN.

THE RICHEST ONE PERCENT OF KIWIS OWN THE TOP FLOOR AND A HALF. THE PENTHOUSE. THEY'VE GOT THE VIEW, AND THEY'VE GOT SPACE. AND SOME LOVELY RUGS.

THE NEXT NINE PERCENT TAKE UP ABOUT THREE AND A HALF FLOORS, MEANING THE RICHEST TEN PERCENT OF KIWIS OWN HALF THE BUILDING. LIFE IS PRETTY GOOD HERE TOO— STILL GOT A VIEW AND A FAIR BIT OF ROOM. NICE COFFEE MACHINES, SOME THROW PILLOWS, YOU KNOW.

THEN MOVING DOWN THE TOWER, WE COME TO THE NEXT FORTY PERCENT, AND THEY TAKE UP THE NEXT FOUR AND A HALF FLOORS. WHICH SOUNDS ABOUT RIGHT. THESE PEOPLE ARE DOING OK— NOT THAT GREAT, BUT NOT THAT BAD. SPEAKING OF BAD...

SERIOUSLY, SIT DOWN, THIS IS DEPRESSING...

THE POOREST 50% OF THE COUNTRY? THEY LIVE IN HALF OF THE GROUND FLOOR. HALF THE COUNTRY, IN HALF A FLOOR, WITH LITTLE OR NO ASSETS OR SAVINGS, LIVING WEEK TO WEEK. IT'S CRAMMED AND COLD, AND LIVING LIKE THIS LEADS TO POOR HEALTH, STRUGGLES AT SCHOOL AND A PRETTY BLEAK FUTURE. 50%!
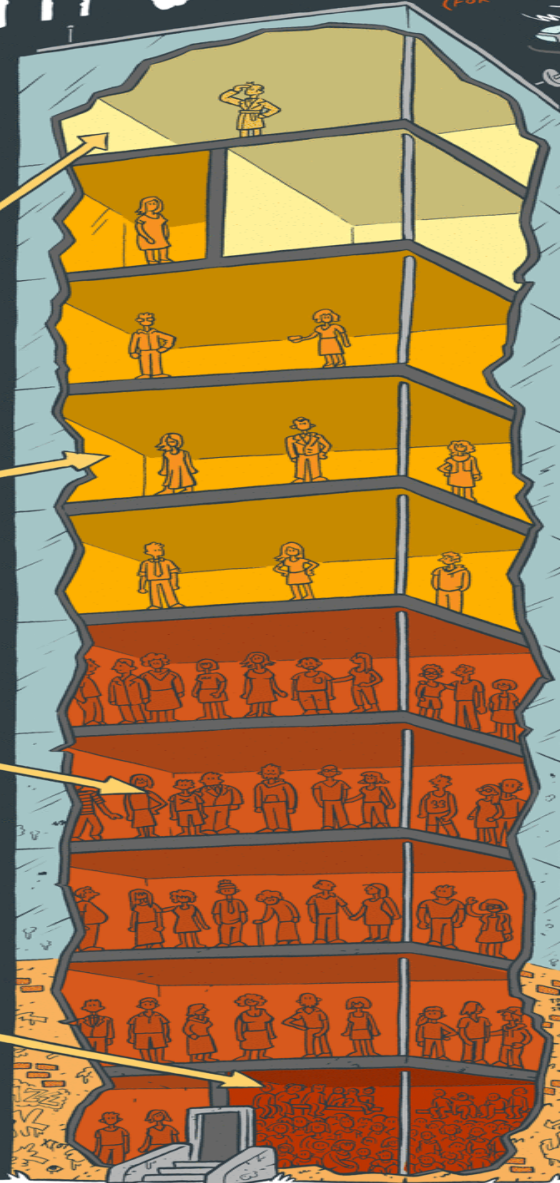
RICHEST 1% OWN 16.4%

NEXT 9% OWN 35.4%

NEXT 40% OWN 43%

POOREST 50% OWN 5.2%

STATISTICS FROM STATISTICS NZ REPORT "WEALTH DISPARITIES IN NEW ZEALAND"
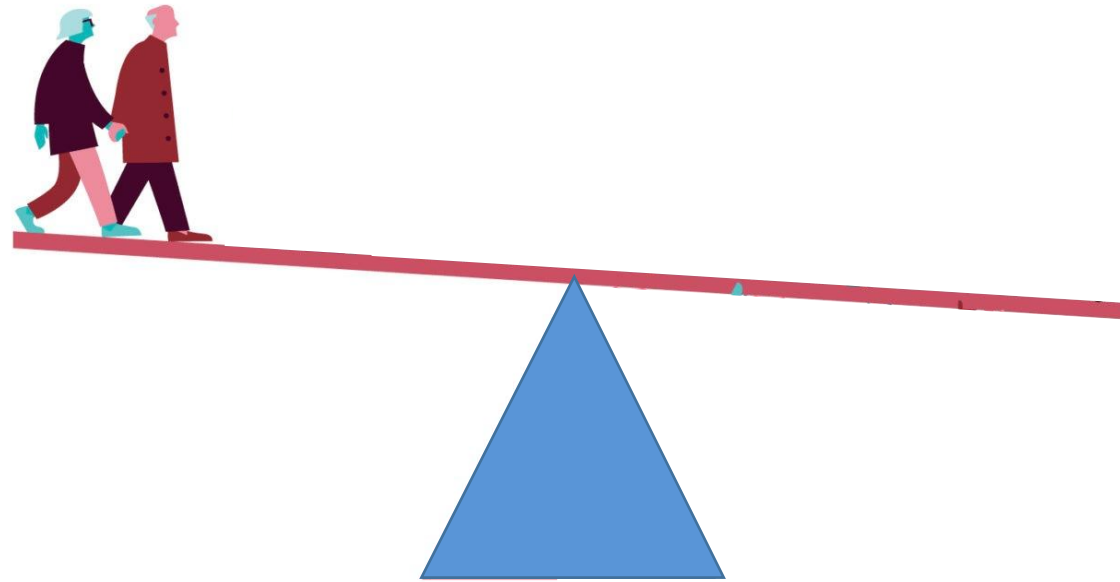
Your zip code tells you more about your health than your genetic code!

Talk outline

- History of N.Z. health system
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Healthcare

$

Healthcare

Healthcare

$

Healthcare

$

Healthcare

$

Realities/Context

The patient journey

Realities/Context

The patient journey

Stress
Burn out
Staff shortages

Interviewer: Best thing your mom ever taught you?

Obama: Empathy. Making sure that you can see the world through somebody else's eyes. Stand in their shoes. I think that's the basis for kindness and compassion.
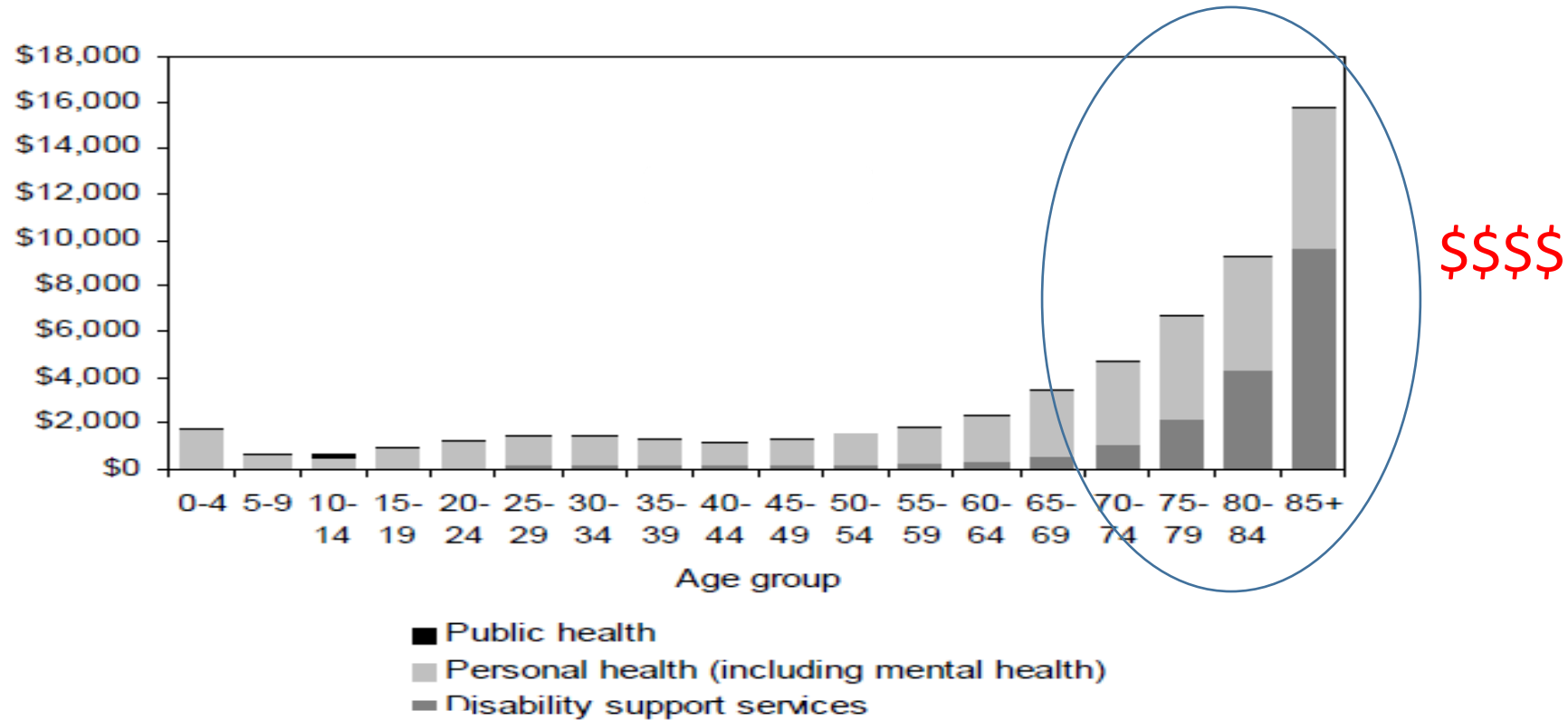
Realities/Context

The patient journey

Talk outline

- History of N.Z. health system
- The changing concept of autonomy
- "Health reforms"
- Social determinants of health
- The complexity of health care
- Demographics / health spending
- Stewardship
- Non-beneficial health interventions
- Pigeons
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Health funding/expenditure

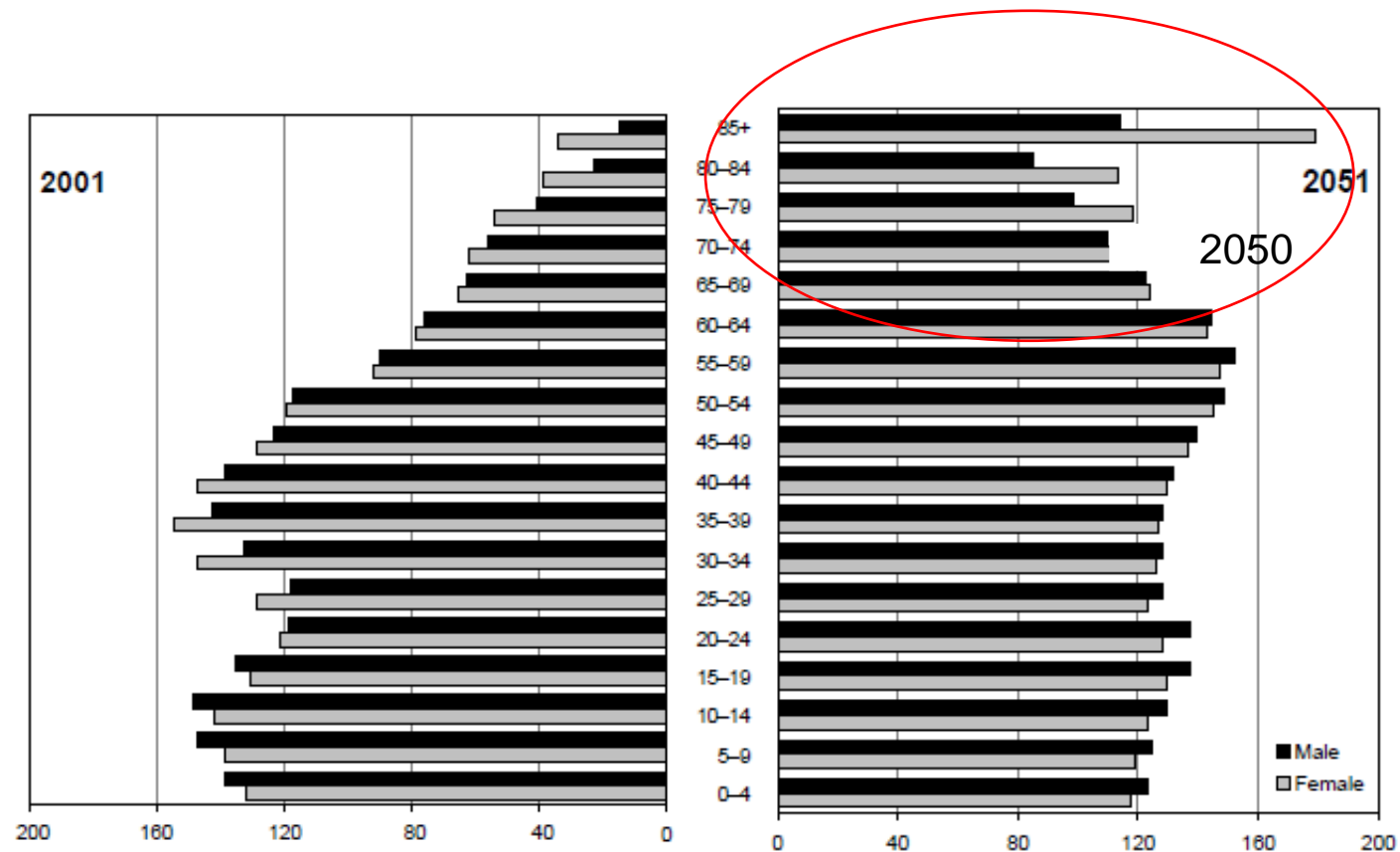**Figure 1 – Annual government health expenditure by age and service group (males and females combined), 2001/02**

$$$$

Source – Ministry o

1: Demographics = "Baby Boomer" Bulge
NZ Population 2001 to 2051 (5 year age bands to 85+)

1: Demographics = "Baby Boomer" Bulge
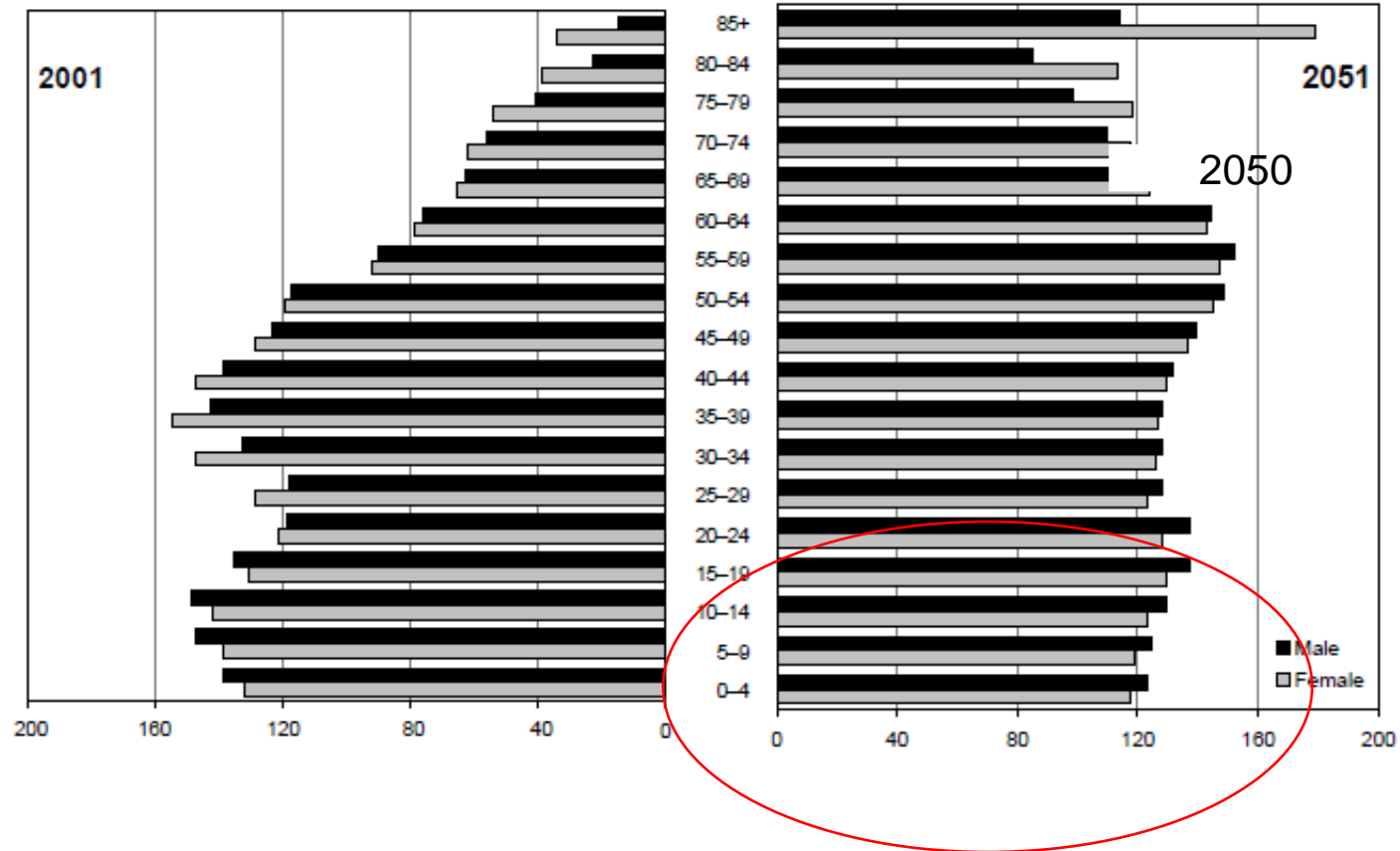## NZ Population 2001 to 2051 (5 year age bands to 85+)

Table 16. *Older adult population projections (65 years and older) for all ethnic groups, for years ended 31 December 2017 to 2027, by DHB-locality*

DHB-locality	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Auckland	56,850	59,300	61,860	64,490	67,080	69,680	72,370	75,010	77,810	80,810	83,930
Bay of Plenty	44,560	46,030	47,650	49,250	50,820	52,400	53,810	55,390	56,950	58,810	60,670
Canterbury	85,900	89,230	92,560	95,850	99,480	102,910	106,150	109,850	113,590	117,670	121,930
Capital and Coast	40,540	41,980	43,480	44,930	46,460	47,860	49,490	51,150	53,100	55,050	57,010
Counties Manukau	61,730	64,180	66,860	69,520	72,250	74,960	77,830	80,880	84,090	87,490	90,960
Hawke's Bay	30,100	31,100	32,100	33,120	34,100	35,180	36,150	37,330	38,490	39,720	40,940
Hutt Valley	21,440	22,090	22,760	23,510	24,280	25,170	25,950	26,940	27,890	28,890	29,860
Lakes	17,180	17,770	18,400	19,030	19,630	20,240	20,820	21,490	22,200	22,960	23,760
MidCentral	30,800	31,580	32,490	33,420	34,310	35,270	36,210	37,280	38,330	39,430	40,640
Nelson-Marlborough	31,090	32,230	33,370	34,580	35,870	37,110	38,340	39,630	40,920	42,290	43,560
Northland	33,550	34,780	36,040	37,300	38,700	39,970	41,230	42,560	43,800	45,190	46,600
South Canterbury	12,970	13,385	13,750	14,115	14,530	14,865	15,180	15,640	16,030	16,470	16,975
Southern	53,860	55,400	57,130	58,930	60,960	62,760	64,670	66,600	68,680	70,860	73,040
Tairāwhiti	7,265	7,570	7,800	8,085	8,370	8,675	8,935	9,240	9,525	9,865	10,165
Taranaki	20,380	21,070	21,815	22,425	23,025	23,775	24,410	25,195	25,920	26,755	27,630
Waikato	63,390	65,810	68,180	70,810	73,240	75,720	78,240	80,880	83,550	86,350	89,230
Wairarapa	9,245	9,520	9,825	10,135	10,440	10,760	11,010	11,345	11,665	11,950	12,250
Waitematā	82,630	86,090	89,430	92,750	96,010	99,530	103,040	106,910	110,770	114,800	119,070
West Coast	5,840	6,020	6,210	6,415	6,640	6,850	7,055	7,315	7,535	7,815	8,045
Whanganui	12,305	12,635	13,000	13,360	13,820	14,205	14,555	14,980	15,370	15,810	16,250
Total	721,625	747,770	774,710	802,025	830,015	857,890	885,445	915,615	946,215	978,985	1,012,515

Talk outline

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- **Stewardship**
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- Pigeons
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- Autonomy algorithm

Tuaritanga / Stewardship

Our health resources are **valuable** and **limited**

We all have to use them **wisely** and **sustainably**

THE HEALTH SYSTEM

Stewardship: wise sustainable use of resources

"The tragedy of the Commons"

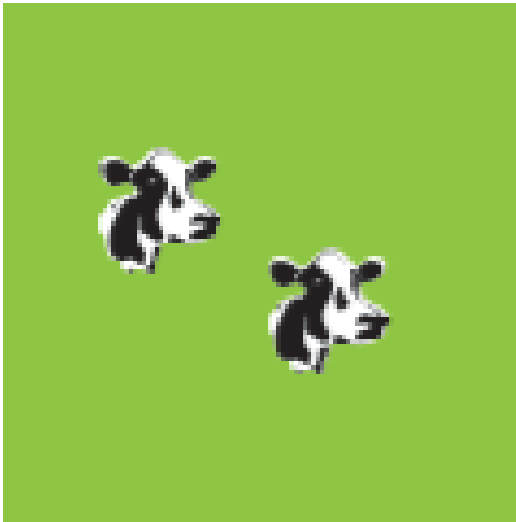Grazing rights need to be exercised sustainably

THE HEALTH SYSTEM
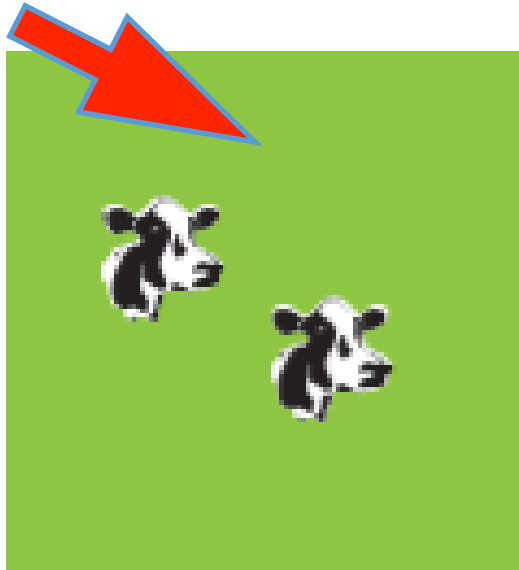
Stewardship: wise sustainable use of resources

"The tragedy of the Commons"

Grazing rights need to be exercised sustainably
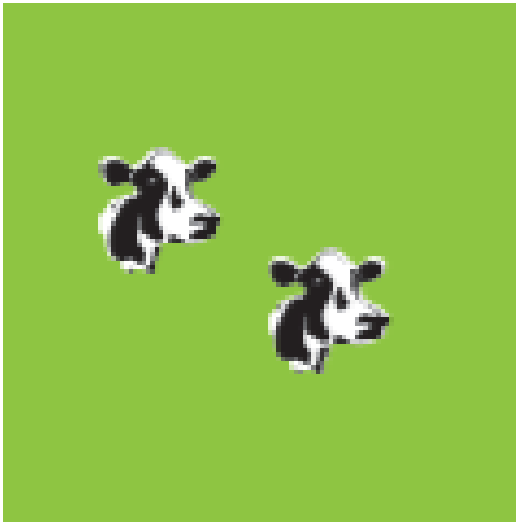
we are not here

Shared resouce
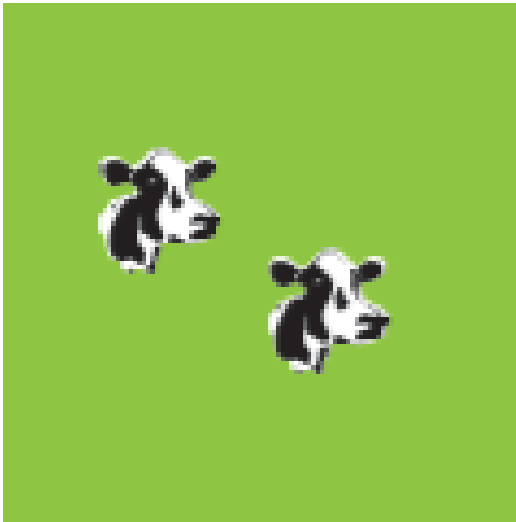
THE HEALTH SYSTEM

Stewardship: wise
sustainable use of resources

"The tragedy of the Commons"

Grazing rights need to be exercised
sustainably

Are we here?
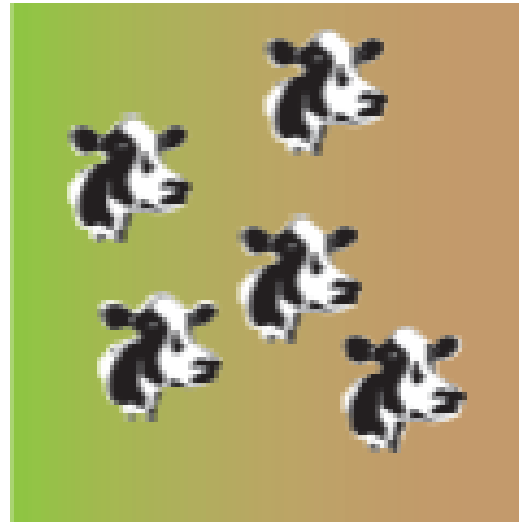
Shared resouce

Sustainable resource

THE HEALTH SYSTEM

Stewardship: wise
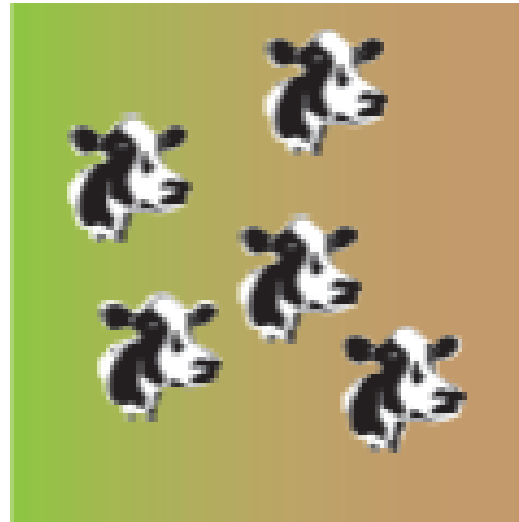sustainable use of resources

"The tragedy of the Commons"
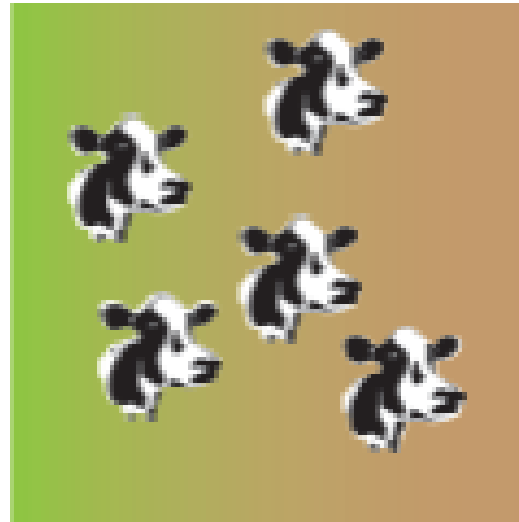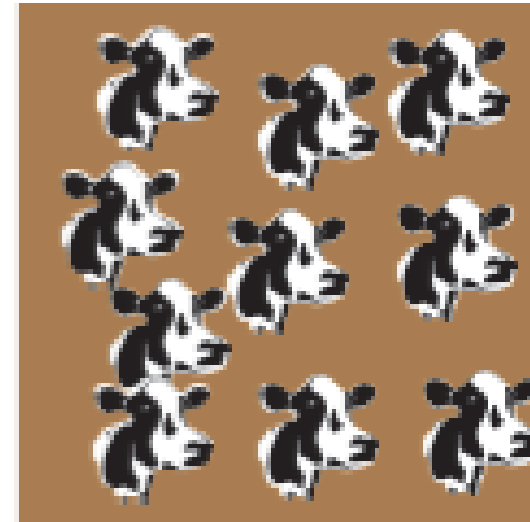
Grazing rights need to be exercised
sustainably

here?

Shared resource

Sustainable resource

THE HEALTH SYSTEM

Stewardship: wise
sustainable use of resources

"The tragedy of the Commons"

Grazing rights need to be exercised
sustainably

ARE WE HERE?

Shared resouce

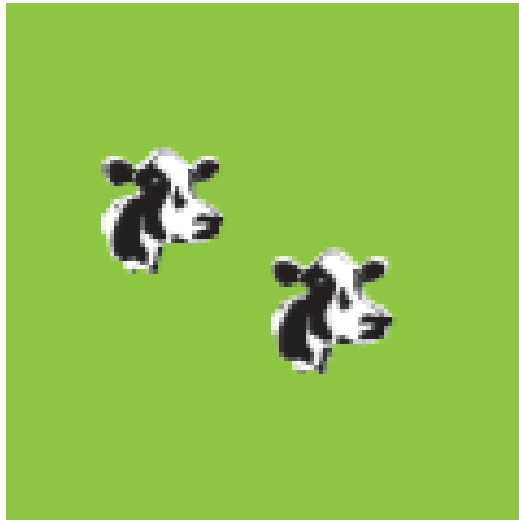Sustainable resource

Depleted resource

THE HEALTH SYSTEM

Stewardship: wise sustainable use of resources

"The tragedy of the Commons"
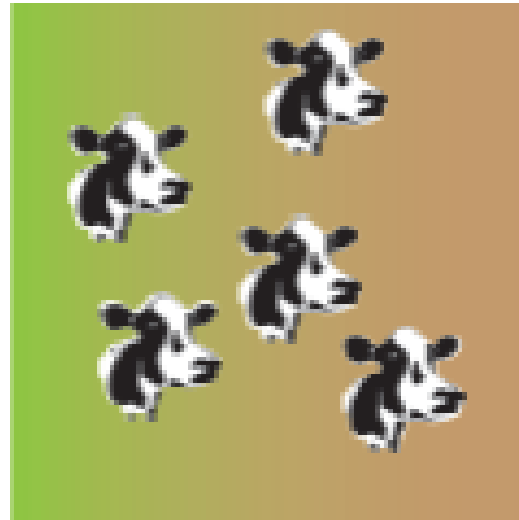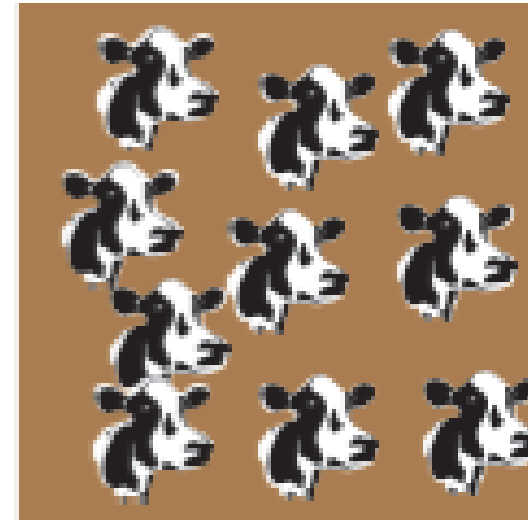
Grazing rights need to be exercised sustainably

OR HERE?

Shared resouce

Sustainable resource

Depleted resource

Garrett Harding and the Tragedy of the Commons
Science 1968

"The unmanaged commons would be ruined

By overgrazing and competitive individualism.

We would be helpless to prevent social disaster"

Stewardship / Tuaritanga

- High community expectations

- Each society needs to define its

  values

    - Wise investment in limited resources

    - Sustainability

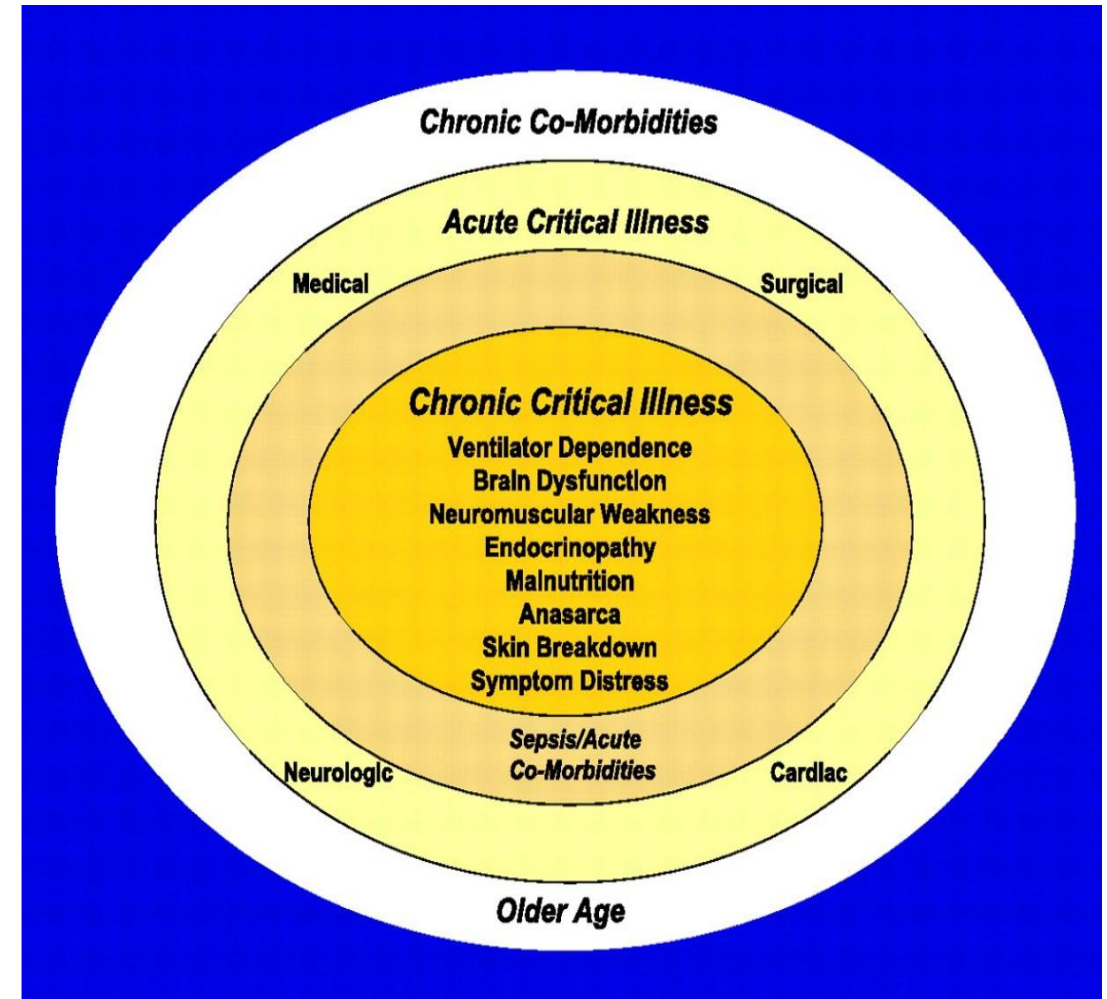- There is a limit to how much we

  can spend on health
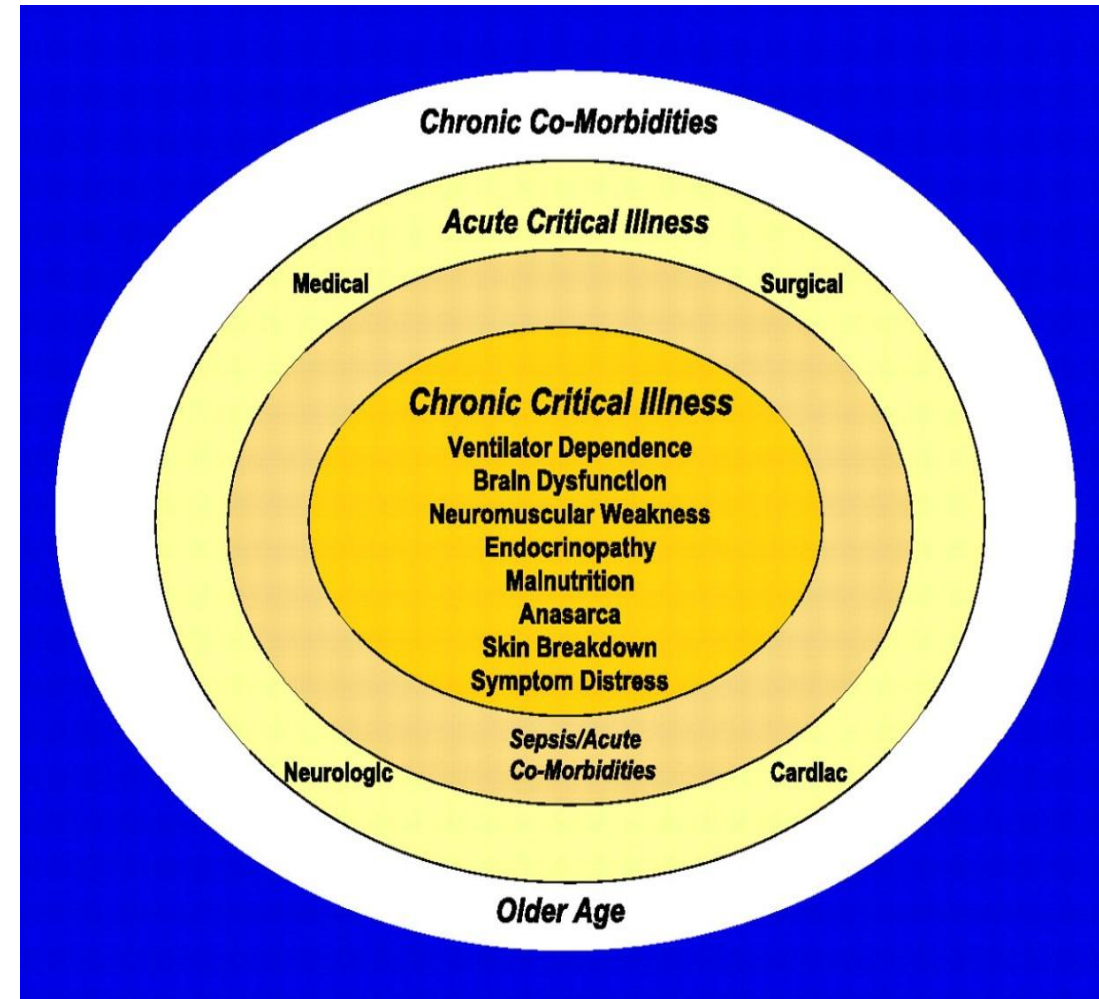
Talk outline

Healthcare

High Community Expectations

- Doctors work "miracles"

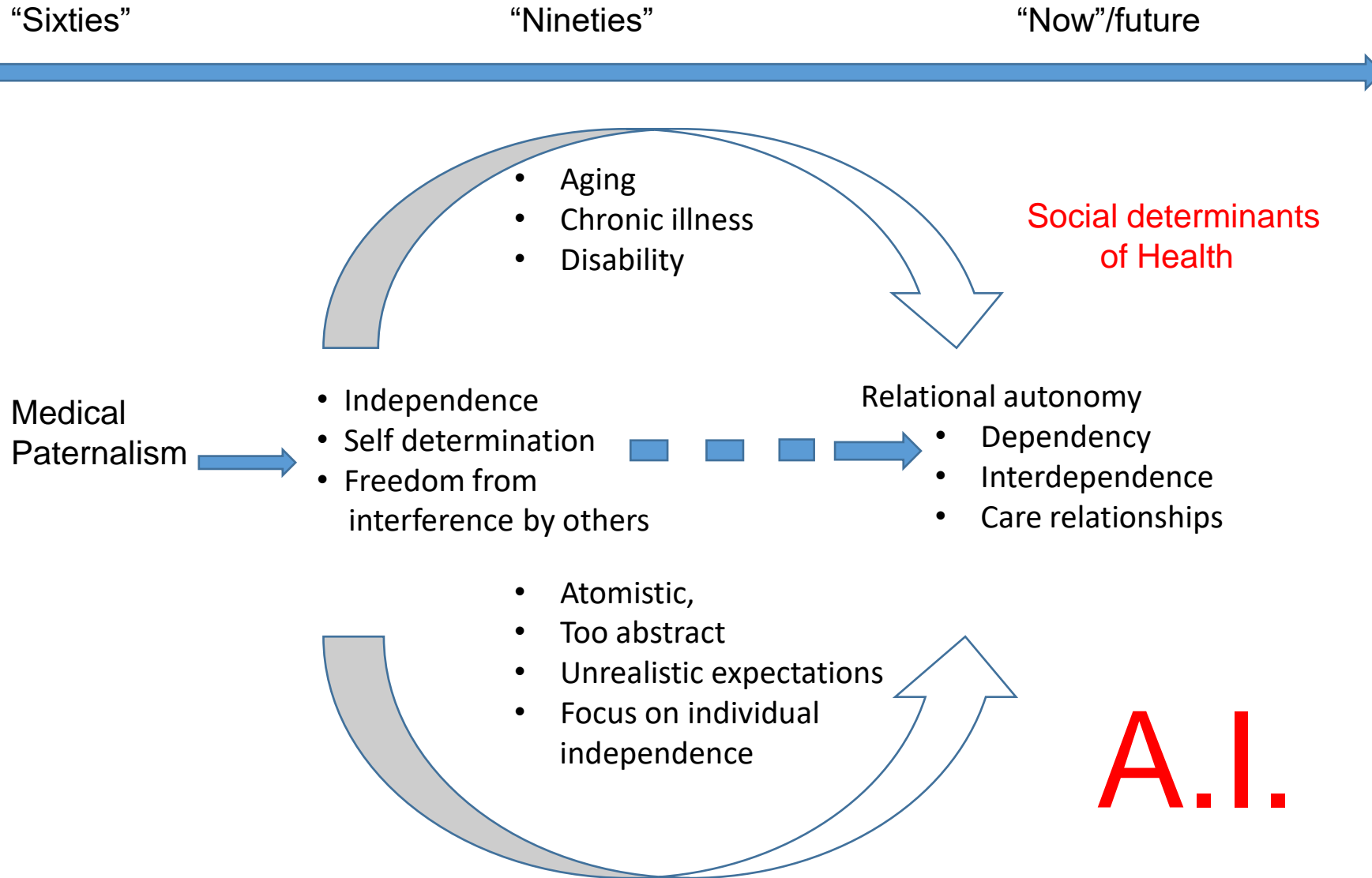- It is sometimes difficult to say NO!

- Evidence from 38 studies and 1.3 million patients
  - 33–38% of patients near the EOL received NBTs
    - Non-beneficial tests were performed on 33–50% of patients with do-not-resuscitate orders
    - N.B.T.
      - Parenteral nutrition
      - Chemotherapy
      - Resuscitation
    - negative repercussions for patients, families, healthcare professionals and the health system.

    - Some N.B.T. inevitable

    - What level is acceptable?

    - Can it be reduced?

The evolution of autonomy

"Sixties"   "Nineties"   "Now"/future

- Aging
- Chronic illness
- Disability

Social determinants of Health

Medical
Paternalism

- Independence
- Self determination
- Freedom from
  interference by others

Relational autonomy
- Dependency
- Interdependence
- Care relationships

- Atomistic,
- Too abstract
- Unrealistic expectations
- Focus on individual
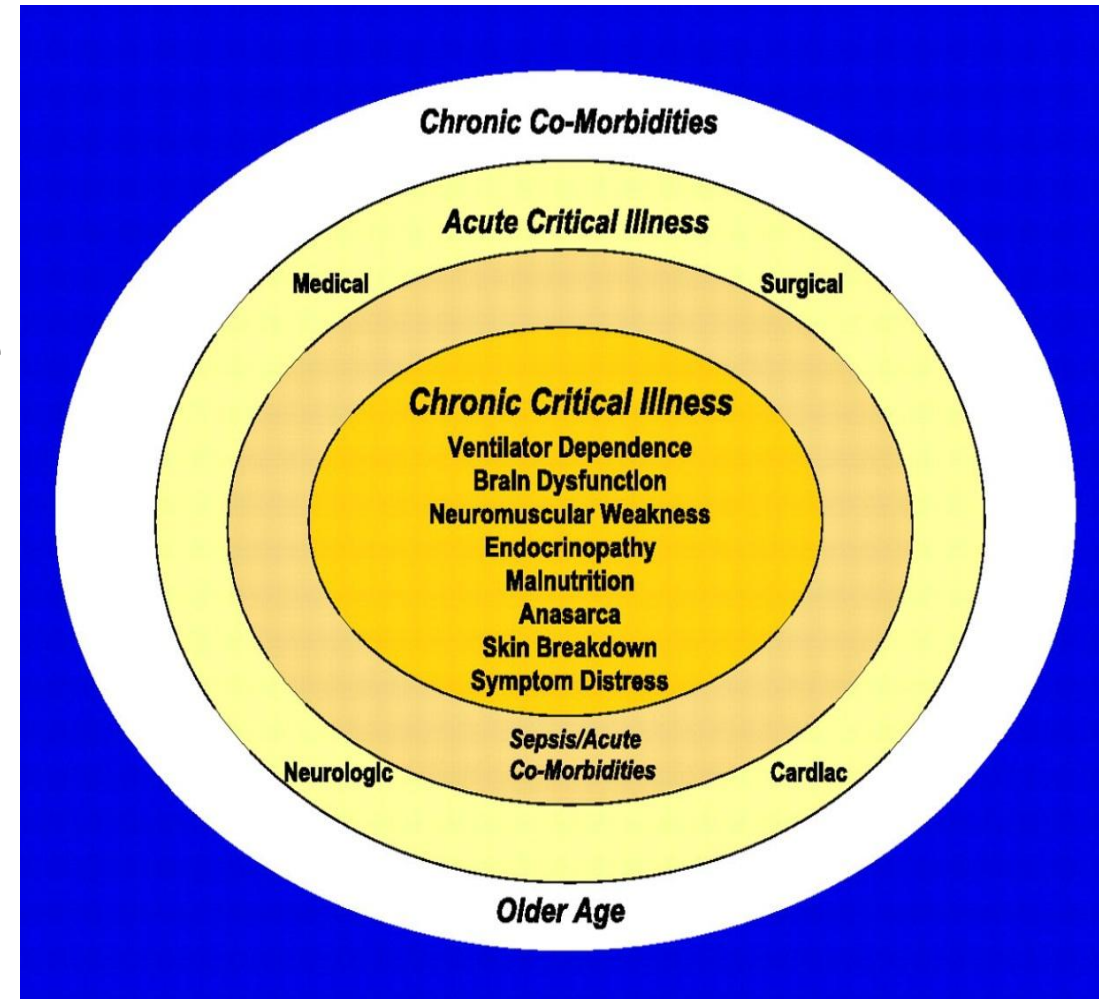 independence

A.I.

- Evidence from 38 studies and 1.3 million patients

  - 33–38% of patients near the EOL received NBTs
    - Non-beneficial tests were performed on 33–50% of patients with do-not-resuscitate orders

    - negative repercussions for patients, families, healthcare professionals and the health system.

    - Some N.B.T. inevitable

    - What level is acceptable?

    - Can it be reduced?

A.I. and healthcare - a few truisms

- Complexity

- Data proliferation

- Multiple potential uses of A.I.

- Clinical trials can be better constructed

- Many aspects of care can be automated

- Surgical robots are becoming more acceptable

- AI can outperform radiologists, dermatologists, ophthalmologists in diagnosis

- Major ethics issues arise and can be anticipated!!!

VIEWPOINT: PEER-REVIEWED ARTICLE

## Should Artificial Intelligence Augment Medical Decision Making? The Case for an Autonomy Algorithm

Camillo Lamanna, MMathPhil, MBBS and Lauren Byrne, MBBS

Incapacity
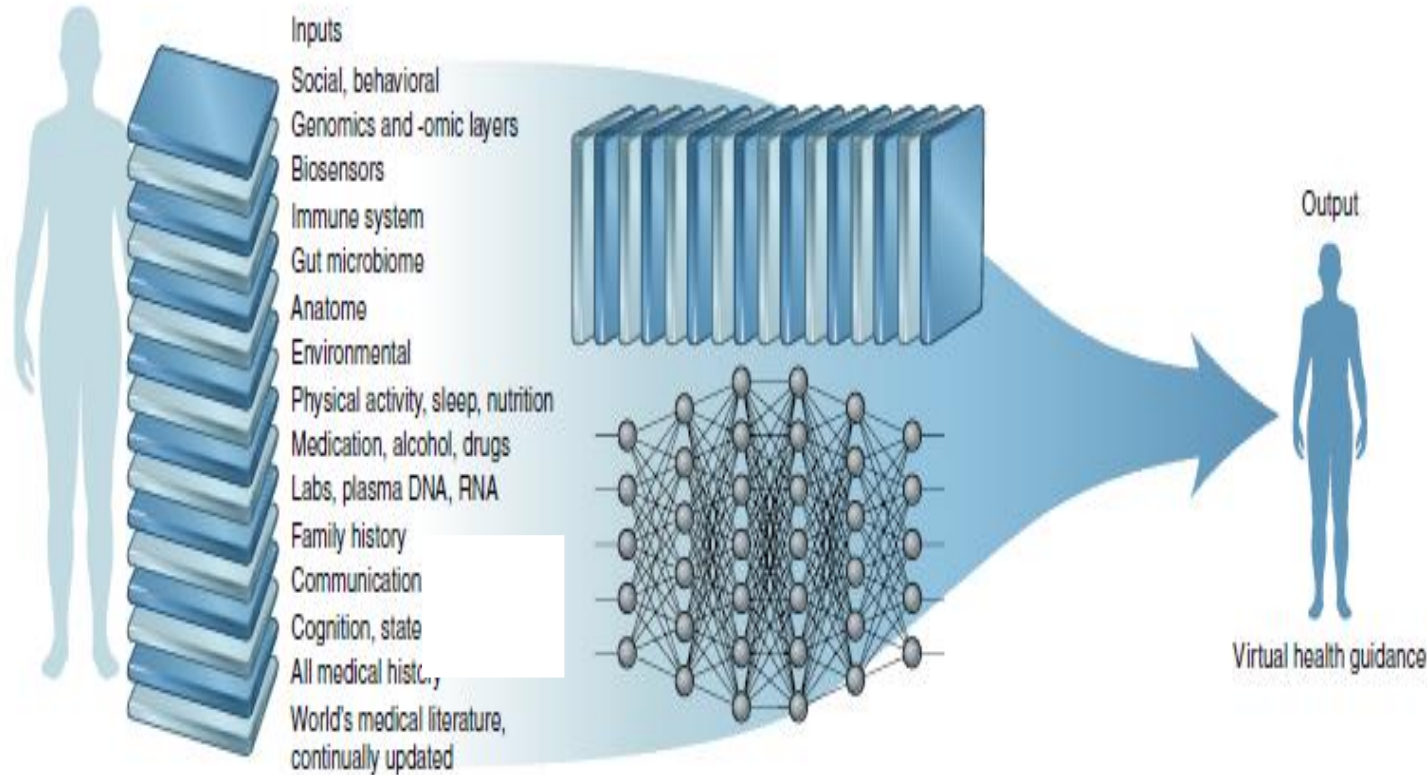
- Up to 1/3rd of elderly and psychiatric hospital inpatients lack decision-making capacity

- Health professionals failed to identify incapacity in 42% of cases.

- Could a physician treatment option NOT match patient's preferences.
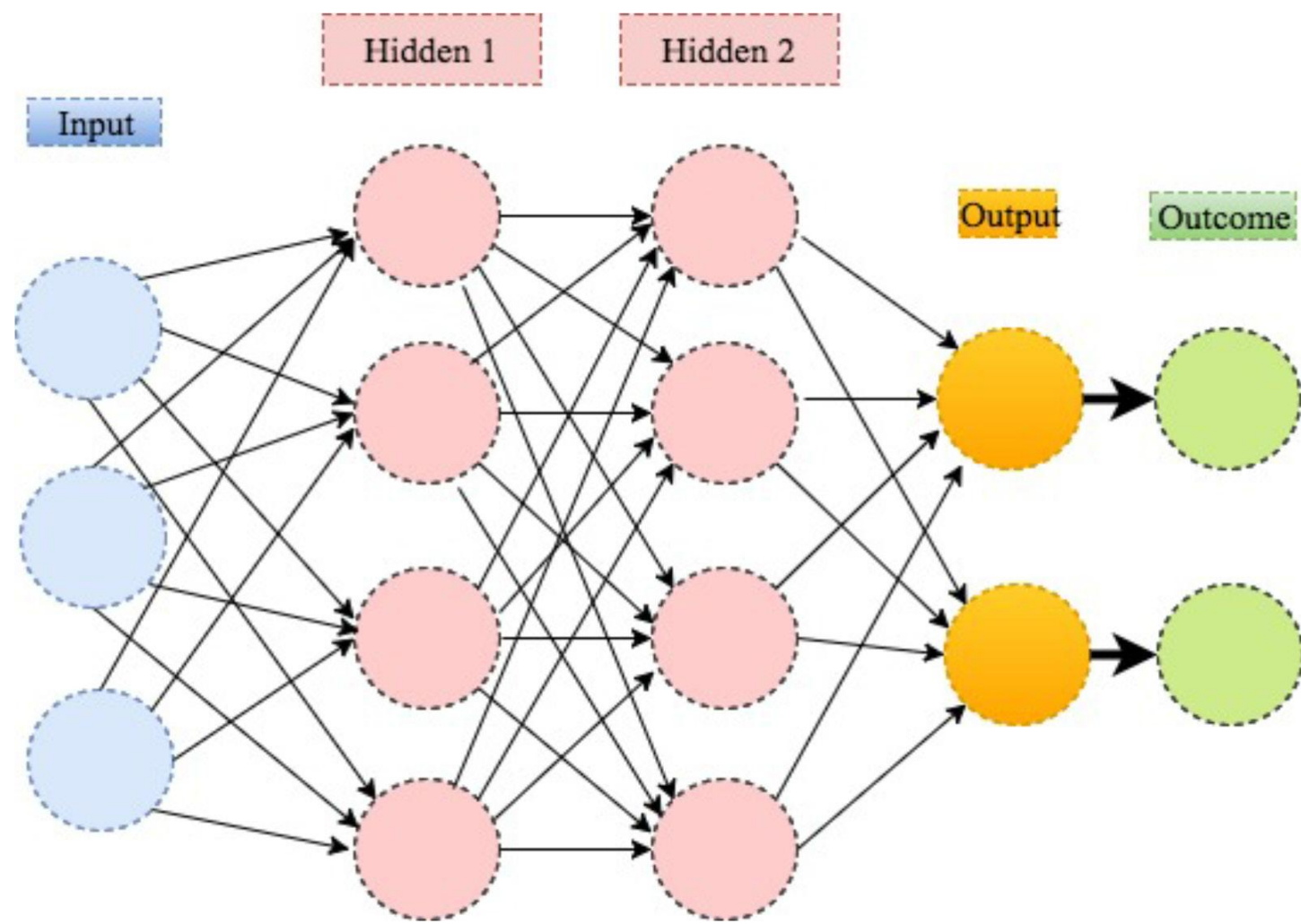
Predictions/decision making/A.I.

- Re admission?
- Critical illness?
  - Likely to survive/die?
    - Intubate?
    - C.P.R.
  - Not likely to survive
    - Palliative care
- A.I. can be better outcome prediction than humans!!

A.I. and decision making

- A.I. knowledge potentially predicts a wide range of things

  - Customer choice

  - Which films they might like !!

  - Health care choices??

  - Could mitigate over treatment

A.I. and decision making

- Artificial intelligence (AI) can mine data from
  - electronic health records (EHRs)
  - social media

- Predict an incapacitated person's treatment preferences

- Patients lacking decision making capacity
  - Need reliable mechanisms to predict patient preferences

Surrogate decision makers

- Incorrect in 1/3 of cases

- Prone to project their wishes/values

- Stressful ++

- This can persist

A.I. Issues/benefits

- Health care systems must respect
  - Emotional burden upon surrogates

  - Society's economic burden

  - Respecting incapacitated person not to receive treatment that they might have declined
- Algorithms are decision *aids* - not *dictates*
- Improved respect for autonomy?
- A machine does not have sleepless nights!!

Assessing "likes"

- M.L. identifies robust link between "death with dignity" and "comfort care" in the general population

- Individual "Likes" "death with dignity"

- Increases probability of "liking" "comfort care"

A.I. and healthcare - a few truisms

- Complexity

- Data proliferation

- Multiple potential uses of A.I.

- Clinical trials can be better constructed

- Many aspects of care can be automated

- Surgical robots are becoming more acceptable

- AI can outperform radiologists, dermatologists, ophthalmologists in diagnosis

- Major ethics issues arise and can be anticipated!!!

Why consider A.I.?

- The "disease burden" of aging population

  - Unsustainable through traditional models of care

  - Justifiable public fears

  - This question needs to be widely discussed

  - Should a bespoke ethics structure be convened now?

  - Legal structures?

  - Corrupted systems?

  - Charlatans?

  - There will be a "gold rush mentality"

  - Can we be good ancestors? Etc . Etc.

INDUSTRIAL REVOLUTION
TRANSFORMING INDUSTRIES AND INNOVATION

INDUSTRY 1.0
Mechanization, steam power, weaving loom

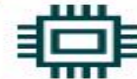### INDUSTRY 2.0
Mass production, assembly line, electrical energy

INDUSTRY 3.0
Automation, computers and electronics

INDUSTRY 4.0
Cyber Physical Systems, internet of things, networks

1784

1870

1969

TODAY

"The ultimate test of a moral society is the kind of world that it leaves its children"
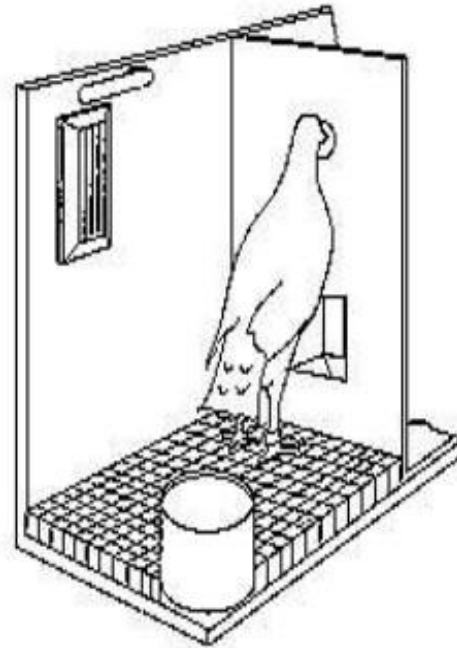
Deitrich Bonhoeffer
D. Bonhoeffer
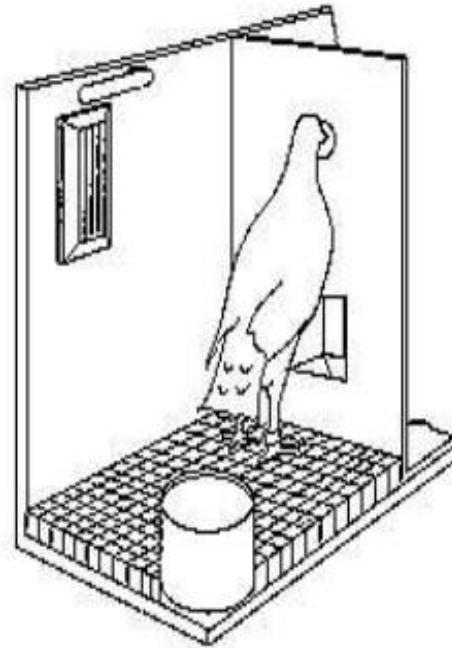
Thanks!!

B. F. Skinner

SKINNER EXPERIMENT

B. F. Skinner

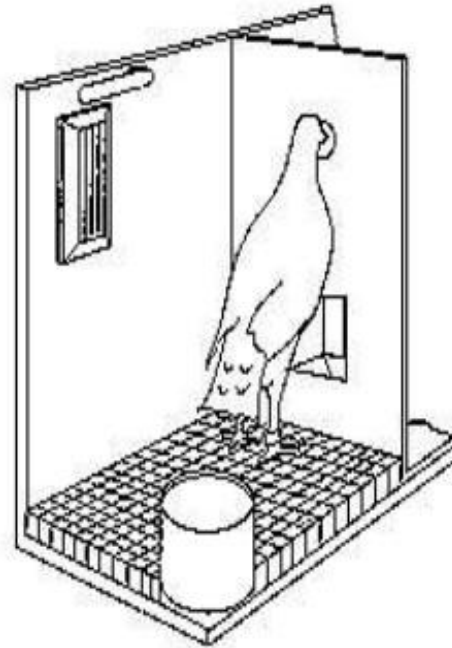**SKINNER EXPERIMENT**

- "Skinner Box"
- Peck on regular basis
- Food reward for correct response
- Establish behaviour-learned response
- Food is the "re-inforcer" of behaviour

B. F. Skinner

SKINNER EXPERIMENT

- Then decrease frequency of rewards

- Pecking becomes intermittent

- Gradually pecking increases

- Pecking then becomes established behavior

- In spite of decreased rewards!!

The "Skinner effect", scrolling and pecking and their role in cell phone utility.
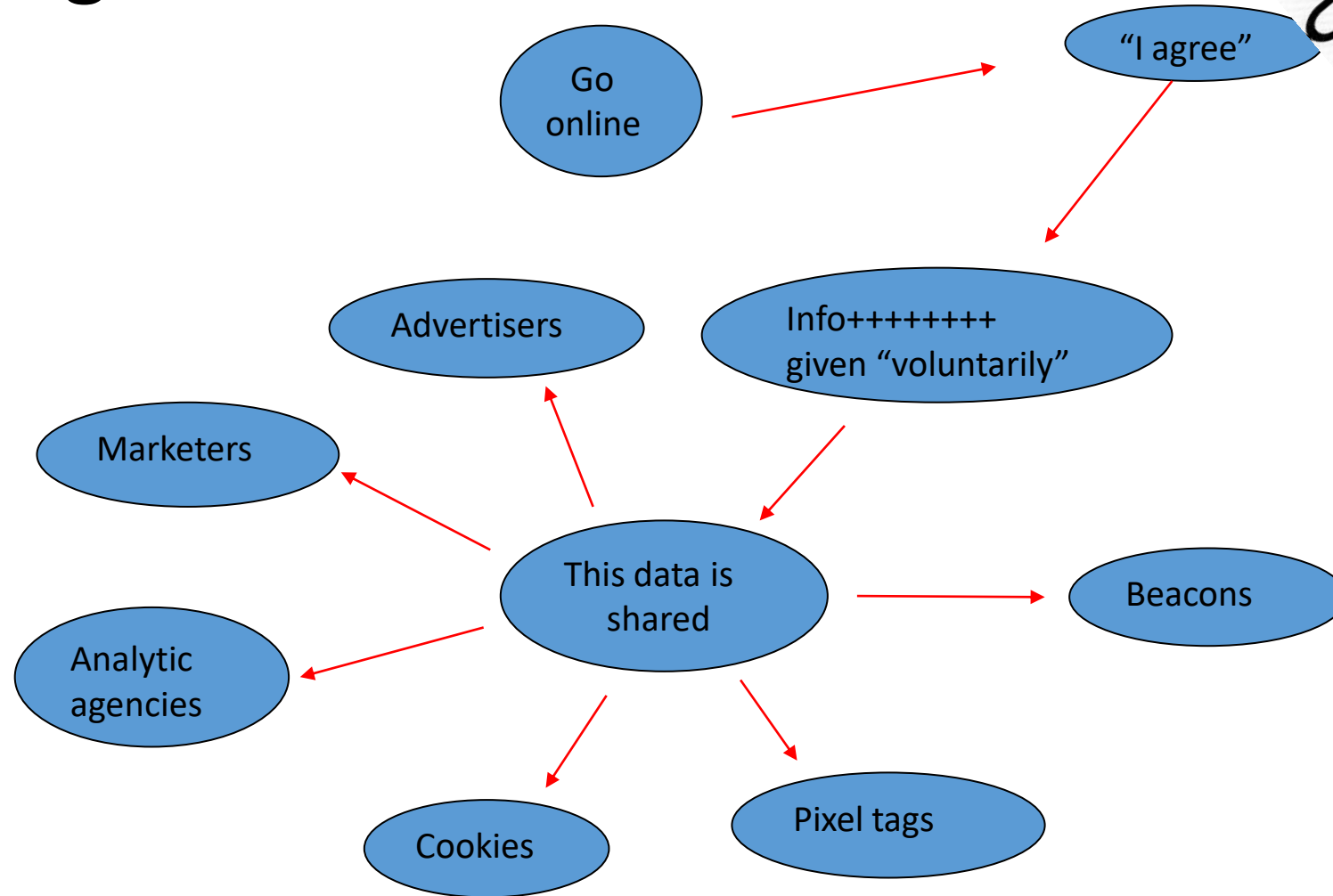
Is scrolling related to pecking?

I agree

The "I agree" cascade

Informed Consent only works in a narrow set of conditions !!

- Infrequent e.g. surgery/chemotherapy
- Risks are visceral
- Perceive the consequences
- Death / complications
- Easily to visualize
- Alternatives
- Refusal-consequences
- You take this decision seriously

Informed consent doesn't work in the data ecosystem

- Frequent decisions

- Harms not visceral – distant and opaque

- Decisions have to be made frequently

- Value is in collectivization

- Everything influences to "Accept"

- Implies you have read the T+C

- You'll continue to click "I agree"

- BUT have you really consented?

Conclusions

- A.I. is a rapidly evolving field

- An ethical framework is needed

- Anticipation is vital (governance and design thinking needed)

- Current approaches may (are) not be fit for purpose

- Trust is vital in the context of uncertainty

- AFIRRM approach - a governance blueprint.

Ethical perspectives on decision making

- Healthcare decisions
  - human model is familiar
  - autonomy, equity, accountability, transparency, permission, harm, benefit, privacy, honesty, consequences.......

- Machine involvement
  - autonomous
  - difficulty with transparency

Outcomes

- More accurate predictions than existing methods.
  - these are which are resource intensive
  - they examine small patient cohorts.

- Help incapacitated patients realize their preferences
  - in spite of being unable to express them
  - reduce the burdens of patients' incapacity by
    - lowering the emotional strain on proxies
    - reducing the economic costs of unwanted tests and treatments.

- Also
  - could algorithm could function as a decision aid to patients with decision-making capacity who are facing complex decisions regarding their own health care.

Conclusion..................

- It will be possible to construct an "Autonomy Algorithm"

- This can estimate confidence for predicted preferences of incapacitated patients.

  - Electronic Health Records – Need to be for for purpose

  - Social media profiles -

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Machine learning, neural networks

- Machine learning is a statistical technique for using data to create a model of intervention to optimise outcomes

- It will predict which treatment protocols are likely to succeed on a patient based on various patient attributes and the treatment context..

- It views problems in terms of inputs, outputs and weights of variables or 'features' that associate inputs with outputs.

Now A.I.

- Aggregate vast amounts of data

- Generate diagnostic and treatment recommendations

- Confidence ratings to recommendations

- Which treatment in likely to work in a particular patient

- The average patient doesn't exist any more

- Complexity demands sophisticated explanations

Ethically Aligned Design

"Ultimately, our goal should be *eudaimonia*, a practice

elucidated by Aristotle that defines human well-being,

both at the individual and collective level, as the highest

virtue for a society"

An essay Prize for young people?

"Please reflect on the core values that helped to establish the world's first continuously functioning health system in 1938. Are they currently being upheld, challenged, irrelevant or ignored?"

$10000 prize !!

CONSILIENCE

Agreement between the approaches to a topic of different academic subjects, especially science and the humanities.

"The unity of knowledge?"

Over Treatment

- The "informed consent" doesn't always work either.

- "Predicting an incapacitated patient's preferences risks under treatment and over treatment.

- Some patients receive investigations / treatments to which they would not have consented

- This is a waste of resources

Over Treatment

- An ethical and economic problem

- Could A.I. algorithms be used to predict which health care choices a patient would make?

Consent what does it actually

mean now and in the future?

Do you have any local plans policies or guidelines?

- A.I. is here
  - Should serve humanitarian ethics / values
  - Any policies?
  - Should reflect a way that is beneficial to people and the environment.
  - A good system enhances trust
  - A collective approach that is needed for its fruitful use in our daily lives.