S is for Social

Hugh Miller

Three ideas

1. Actuaries can add a lot of value in the social sector
2. We live in an uneven society
3. Actuaries should consider the impacts of models and products

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What do we mean by the social sector?

	Rough annual spend
Welfare (gov)	$180b
Housing (gov)	$8b
Education (gov)	$100b
Health (gov)	$130b
Justice (gov)	$30b
Child protection	$5b
Not for profit sector	$130b

	Rough annual spend
Life insurance	$40b-$50b
General insurance	$30b-$40b
Superannuation (fees est.)	$20b-$30b

All these areas are interested in better use of data

Example: Homelessness pathways

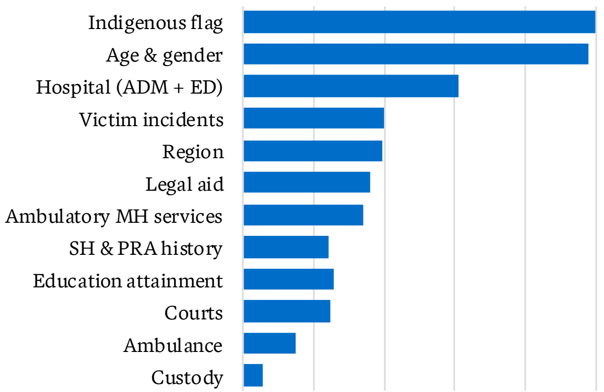
- The project aimed to understand government service use before and after homelessness events, and broader cost to government
- Involved developing a linked dataset comprising a portion of the NSW population linked across 16 government services (Health, Communities, Justice, Education etc)
- Supporting the NSW Premier's Priority to reduce the number of people rough sleeping in the state.

https://www.facs.nsw.gov.au/about/reforms/homelessness/prevention-and-early-intervention/pathways-to-homelessness

Prediction percentiles for model predicting first homelessness presentation

Percentile band for prediction model	% of popln	Proportion of SHS presentations	Rate relative to overall average
1% - 70%	70%	17%	x0.24
71%-90%	20%	21%	x1.1
91%-99%	9%	35%	x3.9
100%	1%	27%	x27.0

Relative importance of predictors in prediction



Homelessness pathways

Young actuaries program NSW | Actuaries Institute

We can also look at prior service use to help find better intervention points

		NSW population			
		Homelessness rate in next year (0.7% base rate)	Risk uplift (risk relative to base)	Coverage (% of all homeless service use)	Cost difference: elevated NSW fiscal cost for those homeless
Ambulatory mental health	Any	10%	13x	16%	$58k
	Psychoactive substance use	19%	26x	3%	$52k
	Disorders personality & behaviour	18%	25x	1%	$62k
Emergency department	Any	2%	3x	42%	$51k
	Mental health diagnosis	16%	21x	3%	$79k
Admitted patients	Any	1%	2x	26%	$55k
	Mental health related	11%	15x	3%	$67k
End of controlled drug treatment spell		18%	25x	3%	$56k
Police: victims incidents	**Any**	5%	7x	29%	$51k
	DFV	14%	20x	4%	$33k
Legal Aid		12%	17x	16%	$55k
Custody spell ending		24%	32x	8%	$48k
Housing tenancy ending		9%	12x	4%	$41k
OOHC spell ending		9%	13x	1%	$60k
CMW Welfare	**Any income support**	2%	3x	63%	$41k
	Any Rent assist.	4%	5x	39%	$39k
CMW MBS – Addiction		9%	12x	4%	$73k
CMW PBS – MH		2%	3x	27%	$49k

People accessing NSW MH services are 13 times more likely to access homelessness in the next year, represent 16% of all presentations, and cost $58k more over three years compared to those not homeless

Homelessness pathways

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Six-year average cost to government, 2020 values

Service	Top 5% of 2011/12 SHS clients (1,500 people), $000	All 2011/12 SHS clients (30,000 people), $000	NSW population (5.8m people), $000
SHS+TA	21	9	0.1
Other NSW housing	12	8	1
Public hospital	137	22	7
Other NSW Health	15	3	0.3
MB& PBS	11	9	8
Child protection	25	2	0.1
Custody & police	201	16	1
Courts & Legal Aid	182	21	1
Welfare (Commonwealth)	102	96	32
NSW Subtotal	**593**	**81**	**11**
Commonwealth Subtotal	**113**	**105**	**40**
Total	**706**	**186**	**51**

Cost to NSW government of those accessing homelessness services are high:

- 7 times higher for the group presenting to a specialist homelessness service (SHS). Only 11% of cost relates to the homelessness sector – most relates to other services.
- For the highest-cost 5% subgroup within the SHS cohort, the average cost to NSW gov. is $593k. Most of this is in the hospital and justice sectors.
- Welfare receipt is very substantial for those accessing SHS – typically Jobseeker, Disability and Parents benefits.

How do actuaries add value?

- Strong data skills, plus tailored communication
- Long-term projections that can justify early intervention
- Understanding of risk factors and the potential for targeting

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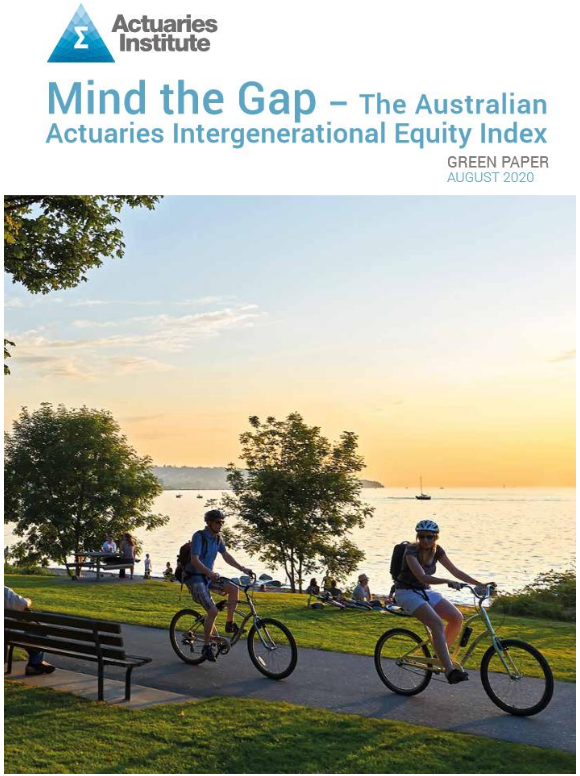
Intergenerational effects

Intergenerational inequity is probably higher today than it has ever been:

- Housing
- Wealth accumulation
- Government debt and spending patterns
- Environment

https://actuaries.asn.au/microsites/australian-actuaries-intergenerational-equity-index
https://www.abc.net.au/triplej/programs/hack/hack/12548102



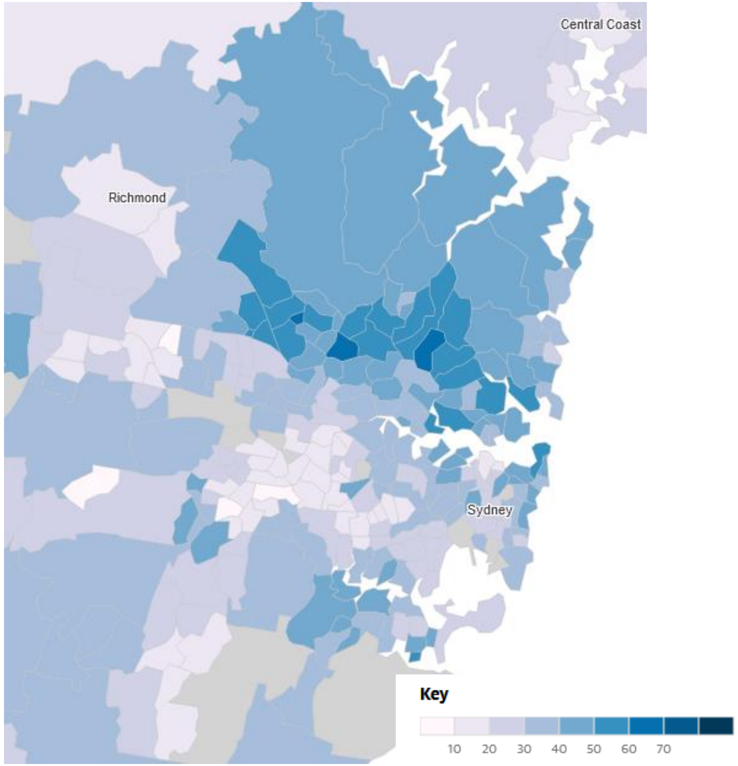
Geographic effects

Geographic stratification is apparent within cities and across regions. Direct implications for:

- Access to services
- Social mobility
- Social cohesion
- Exposure to risks (e.g. natural disasters)

Will tend to intersect with a lot of actuarial work

ABS Household advantage and disadvantage index – proportion of households in top quartile. Via the Guardian



Other effects

Many other vulnerable or disadvantaged populations in our society:

- Ethnicity (including First Nations people)
- Gender
- Disability

Closing the Gap progress, 2020 report. Blue box represents 'on track'

Target	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUS
Child mortality (2018)[b]	—	—	—	—	—	—	—	—	
Early childhood education (2025)									
School attendance (2018)									
Literacy and Numeracy (2018)[c]									
Year 12 or equivalent (2020)[d]									
Employment (2018)[e]									
Life expectancy (2031)[f]		—		—	—	—		—	

https://www.closingthegap.gov.au/

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Considering vulnerable groups

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Finding	Implications
Almost 1% of Australians received support from a specialist homelessness service in 2022	How accessible are products to people without a stable address?
About 0.4% of people report domestic violence to the police each year. Perhaps 3x for total partner violence each year.	Are there accessible products for people escaping domestic violence (e.g. without their own credit history)?
The 12% of postcodes with poor home insurance affordability are much more likely to also be lower-income areas https://actuaries.asn.au/Library/Miscellaneous/2020/GIRESEARCHPAPER.pdf	How are other tools (mitigation, standards, pooling) being used to improve affordability?
1 in 4 people are 'digitally excluded' (combination of access, affordability and ability) https://www.goodthingsfoundation.org.au/the-digital-divide/	How reliant is a product on online services?
15% of people do not have access to small amounts of credit https://www.nab.com.au/content/dam/nabrwd/documents/reports/financial/2014-measuring-financial-exclusion-in-australia.pdf	How targeted are products to higher-income individuals to the exclusion of others? What happens if someone fails to pay on time?

Privacy and model interpretability

Often privacy and model governance are seen as obstacles.
But:

- Good privacy settings can ensure fairer products, and lowers the frequency and severity of data breaches.
- Much of model governance is articulating things we should be able to know about a model, particularly around effects on vulnerable groups
  - Why is this prediction so high?
  - How's the model treating group X?
  - How are we checking for model misbehaviour?
  - Are we complying with customer rights / expectations?

Again, actuaries are well placed to advise

~~Three~~ Four ideas

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4. There's a lot of good stuff out there to learn more