

# Examining the wellbeing impacts of urban regeneration using administrative data

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## Disclaimer

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Stats NZ. For more information about the IDI please visit <https://www.stats.govt.nz/integrated-data/>.

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## Presentation structure

01

**What is urban regeneration?**

02

**Literature: urban regeneration and wellbeing**

03

**Data & model: measuring wellbeing & urban regeneration**

04

**Results: wellbeing impacts of urban regeneration in NZ**

05

**Conclusion**

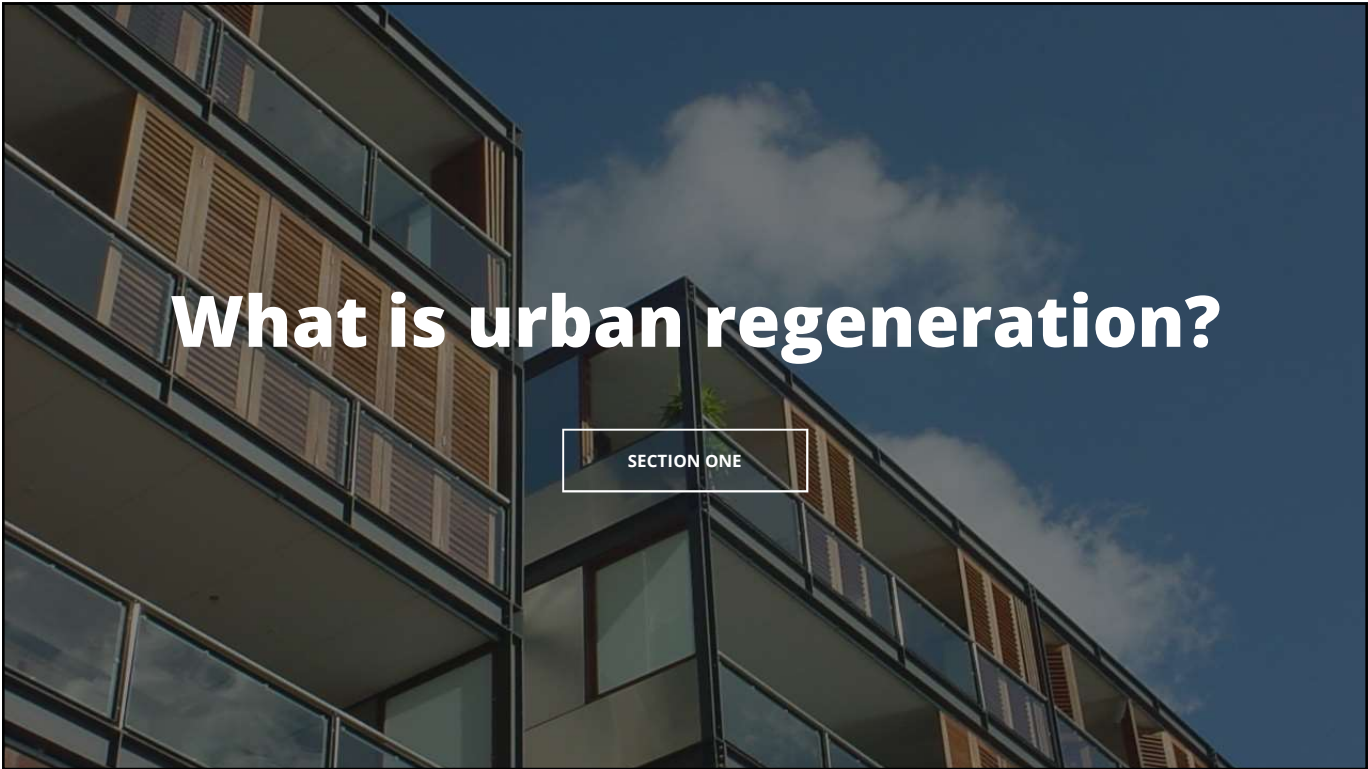
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**BREAKING IT DOWN:**

**Examining the wellbeing impacts of urban regeneration using administrative data**

**This helps ensure current and future urban regeneration developments in New Zealand are guided by empirical evidence.**

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# What is urban regeneration?

SECTION ONE

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**INCREASING THE HOUSING SUPPLY**

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# NEIGHBOURHOOD IMPROVEMENTS

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# REVITALISING TOWN CENTRES

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## IMPROVING EXISTING HOUSING STOCK

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## WALKING AND CYCLING FACILITIES

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**PUBLIC TRANSPORT AND ROAD INFRASTRUCTURE**

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**PUBLIC FACILITIES AND GREEN SPACES**

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## COMMUNITY INTERVENTIONS AND HUBS

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## COMMUNITY INVOLVEMENT

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## Urban regeneration in New Zealand

- Kāinga Ora (KO) government agency responsible for social housing and urban development
- Focused on increasing public and private housing through intensification
- Main policy tool used by government to drive its future housing initiatives



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## Urban regeneration in New Zealand

- KO has built nearly 10,000 new homes since 2018 – majority social housing
- In 2022, invested \$2.3 billion into upgrading and building new homes
- Plans to build 30,000 to 35,000 new homes over the next 10 to 15 years \*
- About half are expected to be built in Auckland



\* May change due to new government & budget cuts

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## Glen Innes



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### SECTION TWO

# Literature: urban regeneration and wellbeing



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# The physical environment in which people live can affect their health and wellbeing

By regenerating urban areas that people live in, we have the potential to improve health and societal outcomes



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# Bridging the knowledge gap

- No strong consensus for the direction of urban regeneration impacts on wellbeing
- Studies are observational, descriptive or qualitative in nature, or rely on cross-sectional data
- Covers only a small sample of the population
- Limited causal evidence between urban regeneration and wellbeing – especially seeing how different populations are impacted



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# Bridging the knowledge gap

Contribution of my research:

1. Framework to measure population-wide wellbeing indicators across human capital, physical & mental health and crime & safety using administrative data; and
2. Evaluating the short- to medium-term wellbeing impacts of urban regeneration in New Zealand



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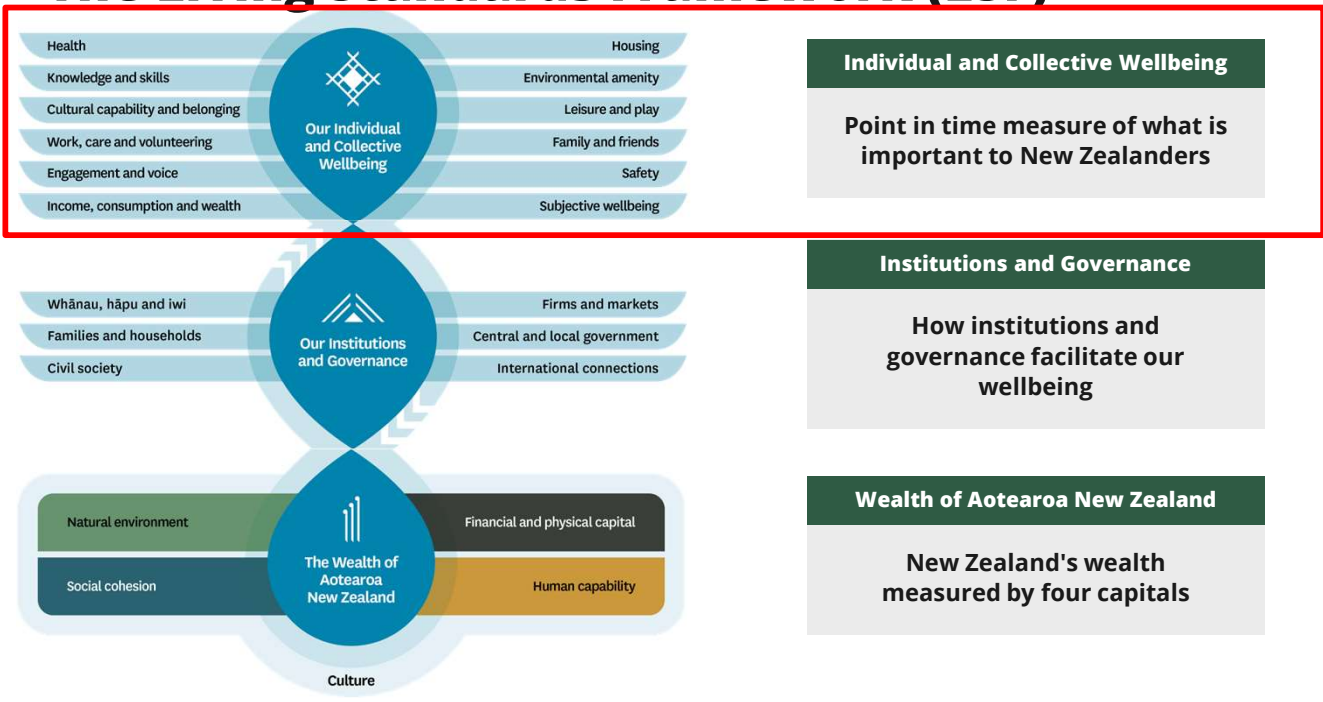
SECTION THREE

# Data & model: measuring wellbeing and urban regeneration



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## The Living Standards Framework (LSF)



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# The Index of Multiple Deprivation (IMD)

Exeter DJ, Zhao J, Crengle S, Lee A, Browne M (2017) The New Zealand Indices of Multiple Deprivation (IMD): A new suite of indicators for social and health research in Aotearoa, New Zealand.

## The New Zealand Index of Multiple Deprivation 2013

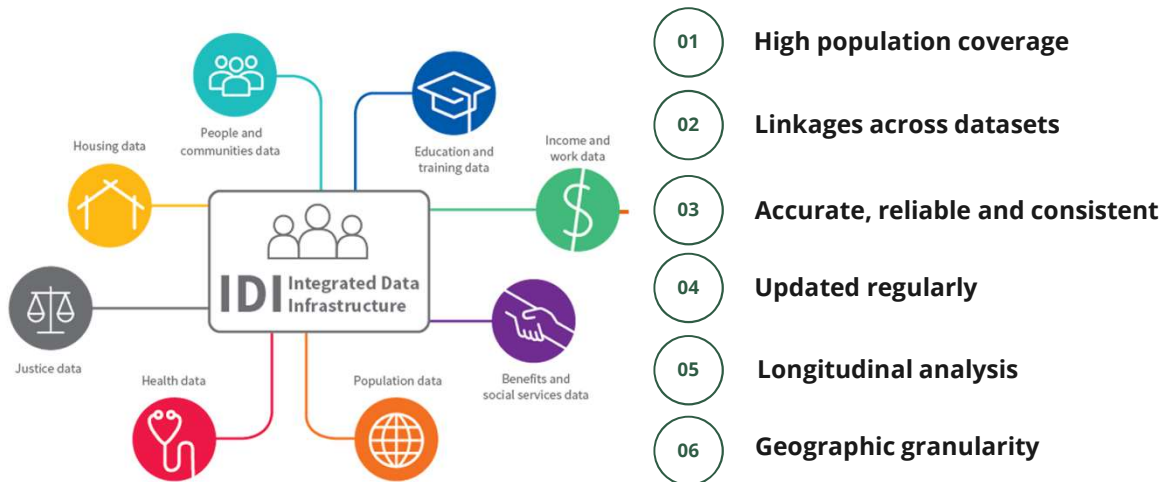
Employment	Income	Crime	Housing	Health	Education	Access
<ul style="list-style-type: none"> <li>Number of working age people receiving the Unemployment Benefit</li> <li>Number of working age people receiving the Sickness Benefit</li> </ul>	<ul style="list-style-type: none"> <li>Weekly Working For Families payments (\$ per 1000 population)</li> <li>Weekly payments (\$ per 1000 population) in the form of income related benefits</li> </ul>	<p>Victimisation rates for:</p> <ul style="list-style-type: none"> <li>Homicide and Related Offences</li> <li>Assault</li> <li>Sexual Assault</li> <li>Abduction and Kidnapping</li> <li>Robbery, Extortion and Related Offences</li> <li>Unlawful Entry With Intent/Burglary, Break and Enter</li> <li>Theft and Related Offences</li> </ul>	<ul style="list-style-type: none"> <li>Number of persons in households which are rented</li> <li>Number of persons in households which are overcrowded</li> </ul>	<ul style="list-style-type: none"> <li>Standardised Mortality Ratio</li> <li>Hospitalisations related to selected infectious diseases</li> <li>Hospitalisations related to selected respiratory diseases</li> <li>Emergency admissions to hospital</li> <li>People registered as having selected cancers</li> </ul>	<ul style="list-style-type: none"> <li>School leavers &lt;17 years old</li> <li>School leavers Without NCEA L2</li> <li>School leavers not enrolling into tertiary studies</li> <li>Working age people without qualifications</li> <li>Youth not in Education Employment or Training</li> </ul>	<p>Distance to 3 nearest:</p> <ul style="list-style-type: none"> <li>GPs or A&amp;Ms</li> <li>Supermarkets</li> <li>Service stations</li> <li>Primary or intermediate schools</li> <li>Early Childhood Education Centres</li> </ul>

For example: health - hospitalisations related to respiratory diseases

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# The Integrated Data Infrastructure

Administrative data collected by government agencies while conducting its business or legislative duties



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# WELLBEING OUTCOMES FRAMEWORK

HUMAN CAPITAL	PHYSICAL AND MENTAL HEALTH	CRIME AND SAFETY
<p><b>Education</b></p> <ul style="list-style-type: none"> <li>• Educational attainment of the adult population (secondary)</li> <li>• Educational attainment of the adult population (tertiary)</li> <li>• Youth NEET rate</li> </ul> <p><b>Labour market</b></p> <ul style="list-style-type: none"> <li>• Employment rate</li> <li>• Median/average earnings</li> <li>• Benefit recipiency (any benefit)</li> <li>• Benefit recipiency (unemployment or sickness-related)</li> </ul>	<p><b>Physical health:</b></p> <ul style="list-style-type: none"> <li>• Emergency department (ED) admissions</li> <li>• Cardiovascular disease (CVD) related hospitalisations</li> <li>• Respiratory-related hospitalisations</li> </ul> <p><b>Mental health</b></p> <ul style="list-style-type: none"> <li>• Mental health services access</li> <li>• Self-harm events (including self-harm resulting in death)</li> </ul>	<p><b>Crime</b></p> <p>Victimisation rates of offences related to:</p> <ul style="list-style-type: none"> <li>• Family violence</li> <li>• Assault</li> <li>• Sexual assault</li> <li>• Theft</li> <li>• Abduction and harassment</li> <li>• Robbery and extortion</li> </ul> <p><b>Safety</b></p> <p>Accidents and injuries related to:</p> <ul style="list-style-type: none"> <li>• Work</li> <li>• Home</li> <li>• Road</li> </ul>

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## Measuring urban regeneration

### Housing intensification data from Kāinga Ora

- Monthly “pipeline” data from 2018 – 2021 (inclusive) showing current and future housing projects in New Zealand
- Shows expected number of dwellings to be built, the location and when it is underway between 2018 to 2021
- Geographic unit of analysis meshblock-level, aggregated to SA2-level to reflect suburb/neighbourhoods



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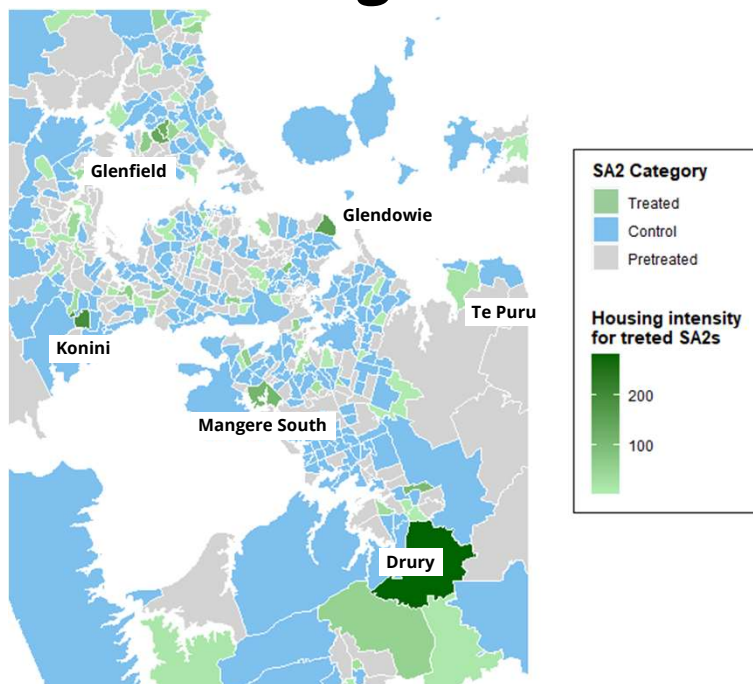
# Measuring urban regeneration

- Auckland-based projects expected to build almost 70% (14,967 out of 21,994 homes) of KO-led UR in NZ
- Additional datasets from KO show Auckland SA2s that underwent UR sometime between 2005-2017 (pre-treated) and excluded from treated
- Meshblock data used to identify which Auckland SA2s undergo UR (treated areas) and SA2s not undergoing regeneration (control areas)
- Excluding pre-treated Auckland SA2s, UR expected to build 3,252 homes (22% of 14,697) in treated SA2s



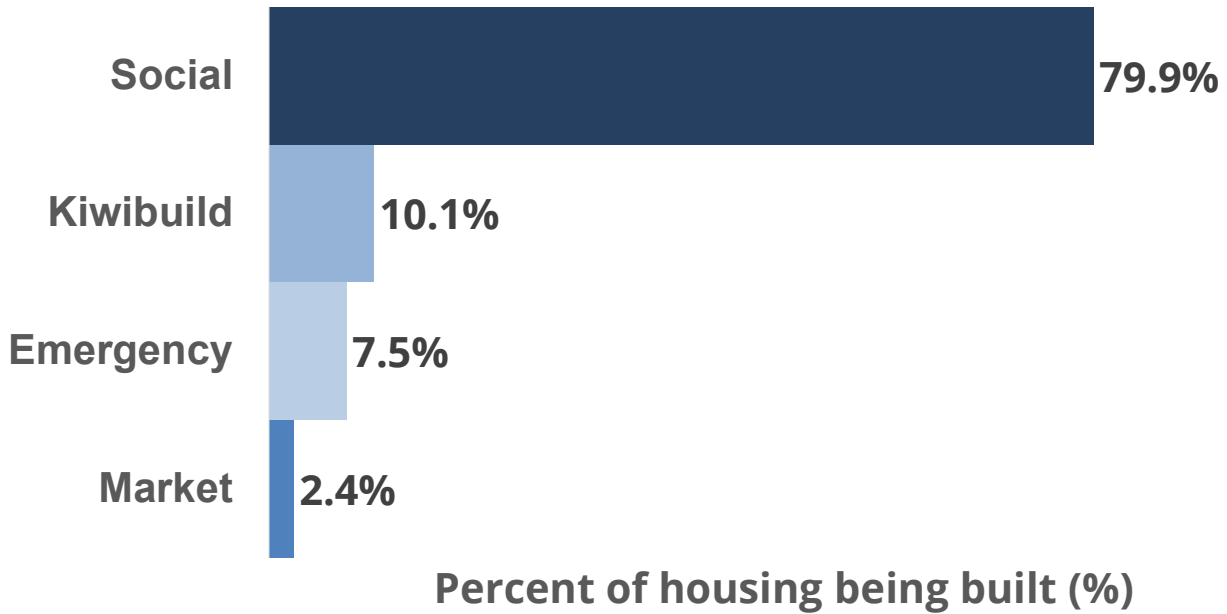
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## Where UR is occurring in Auckland



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## Type of housing being built



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## Measuring urban regeneration

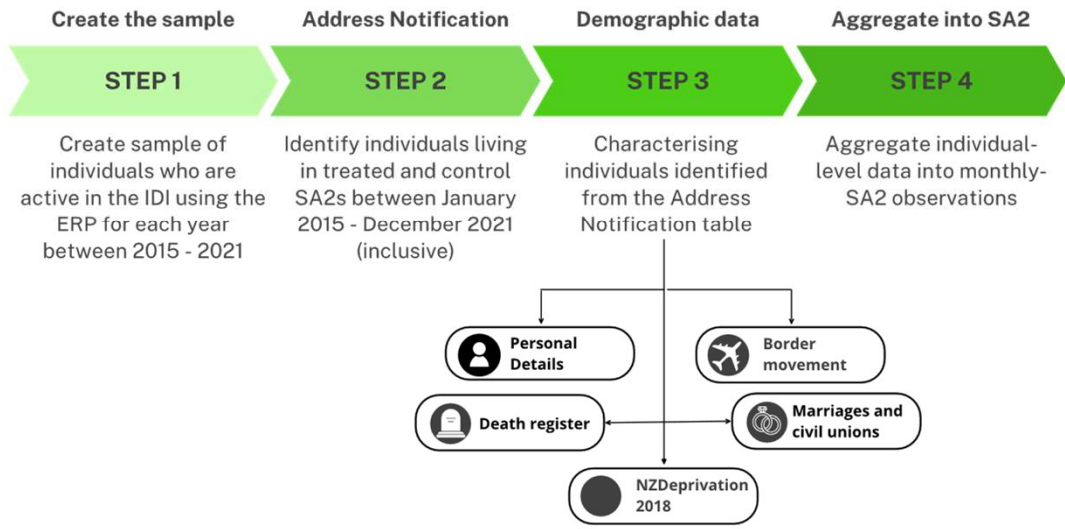
- Important to note that KO data measures only housing intensification
- Therefore, other initiatives such as neighbourhood aesthetics, training and employment hubs and public green spaces - which are part-in-parcel of UR in New Zealand – are not measured
- While these initiatives are occurring at the same time as housing intensification, cannot be disentangled in the data.



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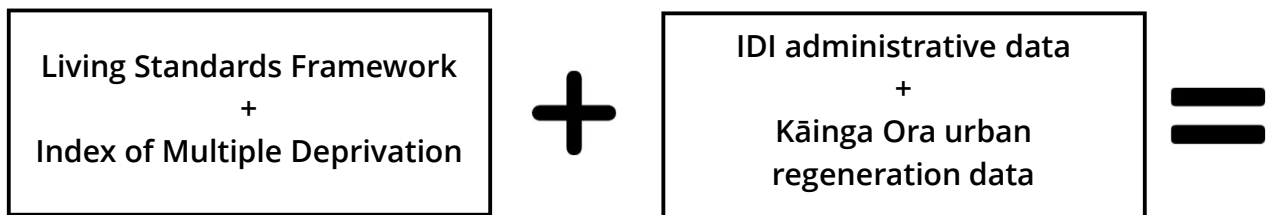


# Sample formation



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## Examining the wellbeing impacts of urban regeneration using administrative data



### Wellbeing indicators



Education



Labour Markets



Physical Health



Mental Health



Crime



Safety

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## ESTIMATING WELLBEING IMPACTS OF URBAN REGENERATION

**Staggered difference-in-differences (DiD)**

Sun and Abraham (2021)

$$Y_{it} = \alpha_i + \lambda_t + \sum_{e \in C} \sum_{\ell \neq -1} \delta_{e,\ell} (1\{E_i = e\} \cdot D_{i,t}^{\ell}) + X_{it}\Gamma + \varepsilon_{it}$$

- $Y_{it}$  is the area-level wellbeing outcome for SA2 $i$  at time  $t$ , related to one of the education, labour, health, crime and safety wellbeing outcomes
- $\alpha_i$  incorporates SA2-specific fixed effects to account for unobserved SA2 heterogeneities that may affect assignment of urban regeneration initiatives and wellbeing.
- $\lambda_t$  incorporates time-specific fixed effects to account for unobserved time heterogeneities that may affect assignment of urban regeneration initiatives and wellbeing.
- $D_{i,t}^{\ell}$  is a relative time dummy that interacts with group dummies (for those  $e \in C$ )
- $X_{it}$  is a vector that incorporates time-variant SA2-specific covariates, including household size, prioritised ethnicity, gender, age group, and partnered status.

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## ESTIMATING WELLBEING IMPACTS OF URBAN REGENERATION

**Staggered difference-in-differences (DiD)**

Sun and Abraham (2021)

$$Y_{it} = \alpha_i + \lambda_t + \sum_{e \in C} \sum_{\ell \neq -1} \delta_{e,\ell} (1\{E_i = e\} \cdot D_{i,t}^{\ell}) + X_{it}\Gamma + \varepsilon_{it}$$

- $i = 1, \dots, N$  SA2
- $t = 0, \dots, T$  months between January 2018 – December 2021 (inclusive) which is the time period at which treatment begins.
- $\ell$  is the relative time period until treatment, and  $\ell > 1$  periods post treatment
- $e = 1, \dots, E$  cohort of SA2s that will undergo treatment in the same month
- Base period is  $\ell - 1$ , which is the month immediately before urban regeneration treatment begins
- Standard errors are clustered at the SA2 level
- $\delta_{e,\ell}$  is the DiD estimator of interest and estimates the causal difference in wellbeing outcomes between treated and control areas for each cohort and their relative time periods.

**For example, if urban regeneration increases educational attainment in treated areas compared to the control areas,  $\delta$  will be positive and statistically significant.**

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## ESTIMATING WELLBEING IMPACTS OF URBAN REGENERATION

**Staggered difference-in-differences (DiD)**

Sun and Abraham (2021)

- Control SA2s weighted to treated SA2s using entropy balancing based on 2015 to 2017 demographic characteristics
- Equation run separately for all UR, high UR (build more than 50 dwellings), low UR (less than 50 dwellings)
- Also separately for all treated, treated social housing and treated non-social housing (i.e. high UR treated social housing)
- Analysis also run at the SA1-level but most effects are not that qualitatively different to SA2

**This research examines the short-term wellbeing impacts of urban regeneration – not enough time has passed to be able to examine medium to longer-term impacts.**

**Second – impact is likely to be underestimated due to exclusion of pre-treated SA2s and treatment not yet finished as of 2021.**

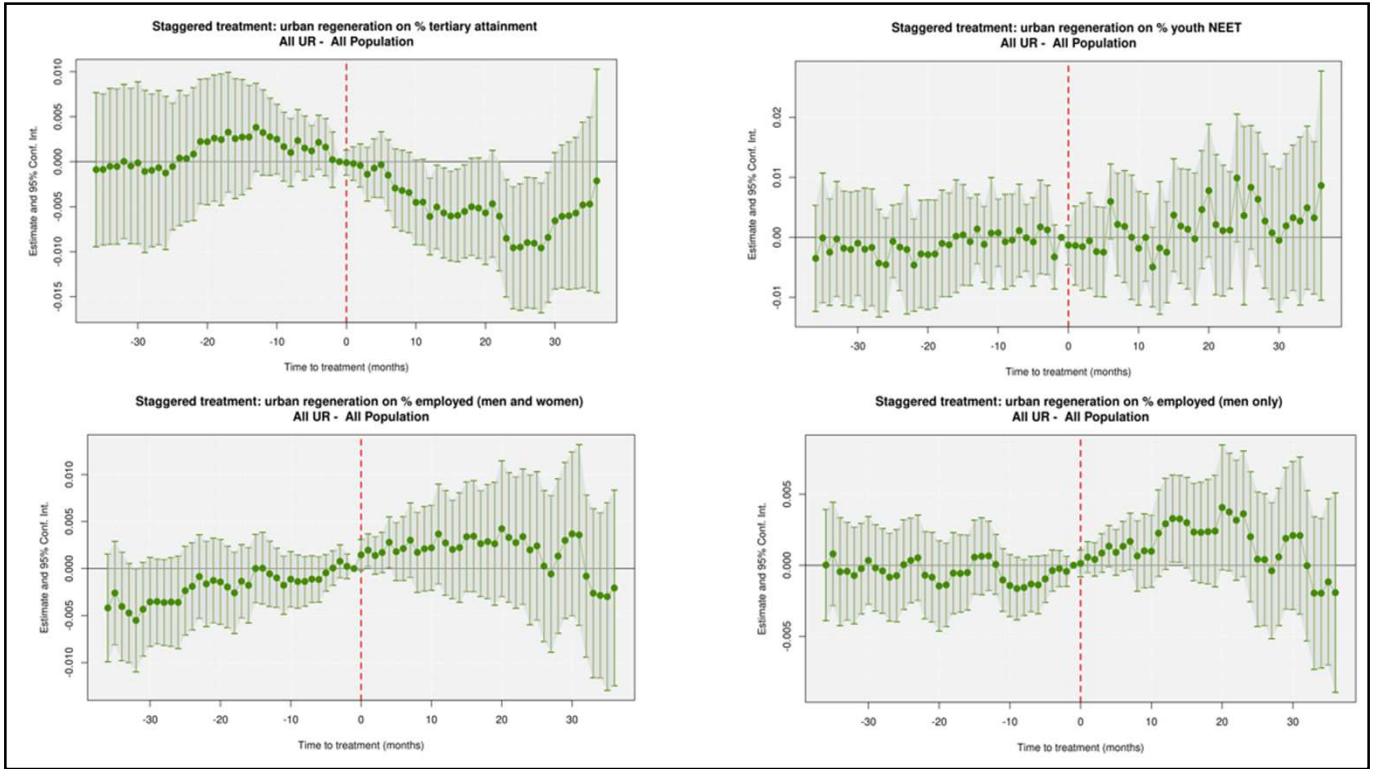
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## SECTION FOUR

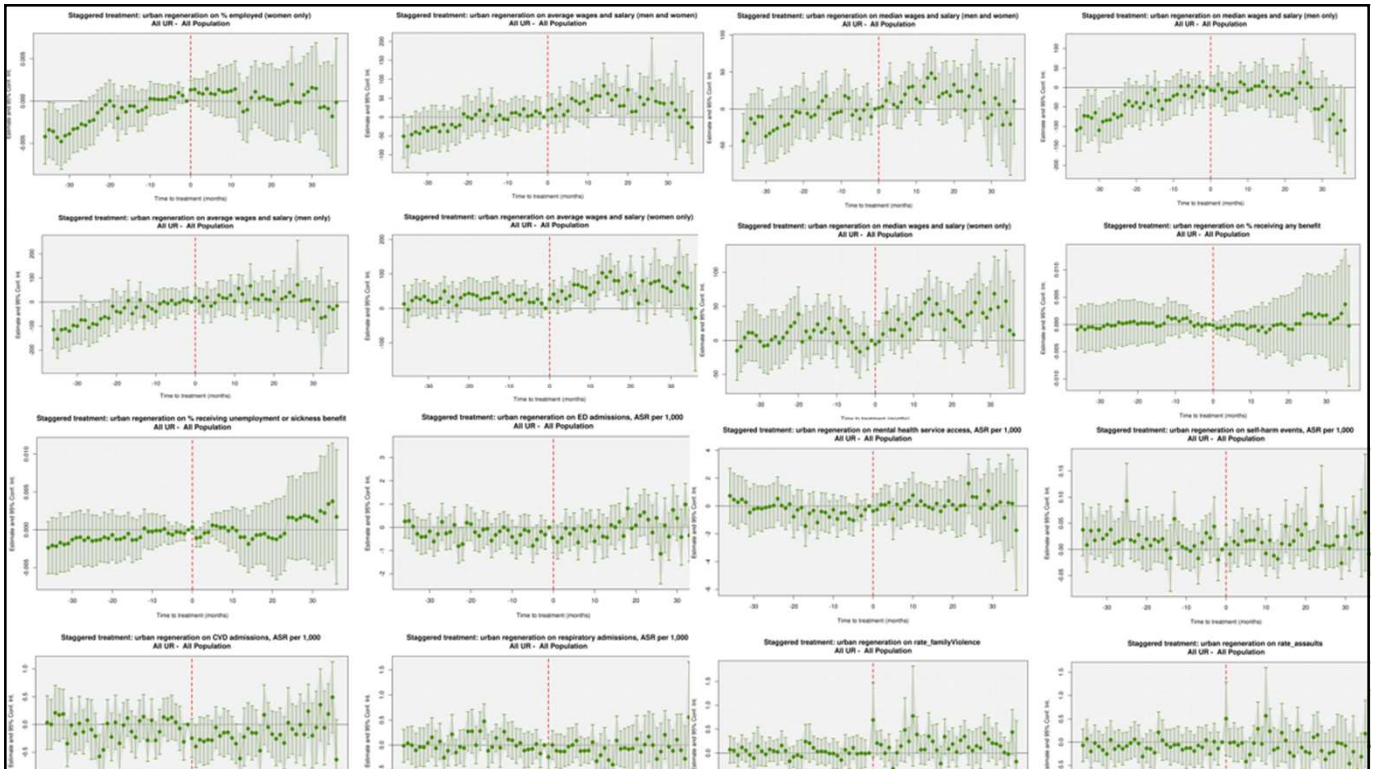
## Results: wellbeing impacts of urban regeneration



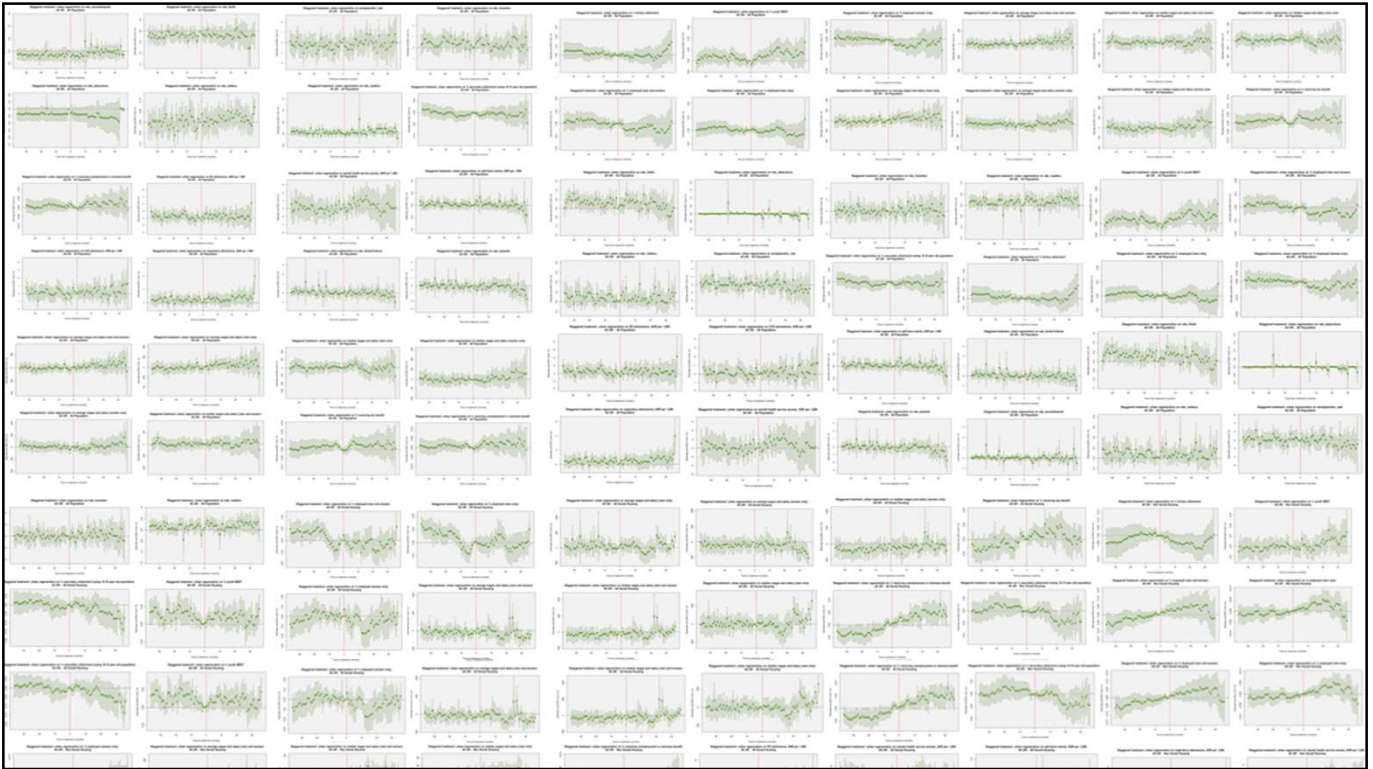
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## First order effects of UR

SA2-level	All UR	High UR	Low UR
Dwellings (n)	<b>1.067</b>	<b>-3.770</b>	<b>2.543</b>
	[-10.803, 12.938]	[-16.048, 8.510]	[-9.507, 14.593]
Social housing (n)	<b>3.065**</b>	<b>2.451</b>	<b>3.310***</b>
	[1.118, 5.012]	[-0.713, 5.615]	[1.595, 5.026]
SH as % of total dwelling (PP)	<b>0.003**</b>	<b>0.002</b>	<b>0.003***</b>
	[0.001, 0.005]	[-0.004, 0.007]	[0.002, 0.005]

**While statistically significant, increase is economically small.**

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## First order effects of UR

SA2-level	All UR	High UR	Low UR
Population (n)	<b>-4.372</b>	<b>-29.636</b>	<b>4.478</b>
	[-48.030, 39.285]	[-79.540, 20.278]	[-37.640, 46.191]
Social housing (n)	<b>9.141</b>	<b>-9.373</b>	<b>15.953***</b>
	[-3.655, 21.938]	[-39.232, 20.486]	[6.801, 25.106]
SH as % of total popn (PP)	<b>0.002</b>	<b>0.002</b>	<b>0.003***</b>
	[-0.001, 0.004]	[-0.004, 0.007]	[0.002, 0.005]

Again, while statistically significant, increase is economically small.

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# Wellbeing over time

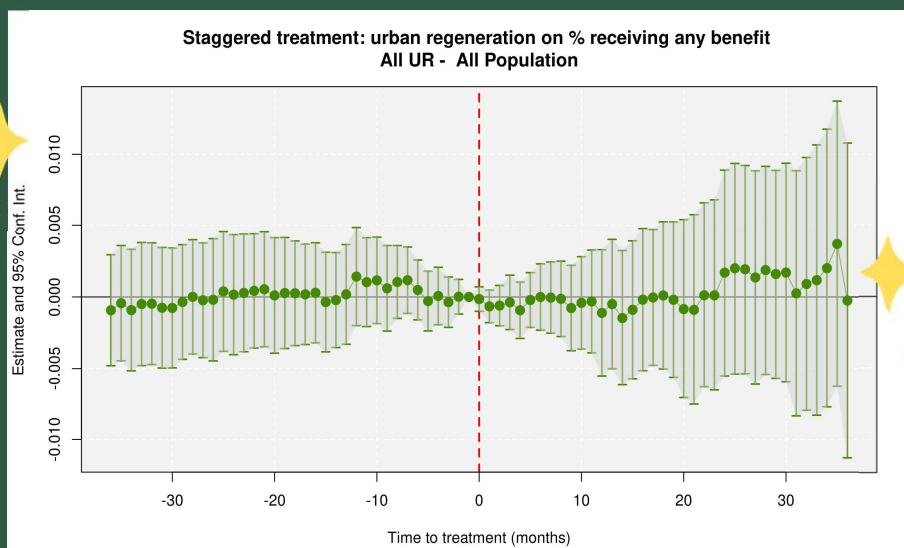
Are wellbeing outcomes improving over time? Getting worse?  
Are changes in wellbeing outcomes unevenly distributed among social versus non-social housing?

Both treated social housing and non-social housing are compared to the full control group. Interested in comparing how area-level wellbeing outcomes changed over time between subpopulations against the same control group.

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## Do things look like they're beginning to improve?

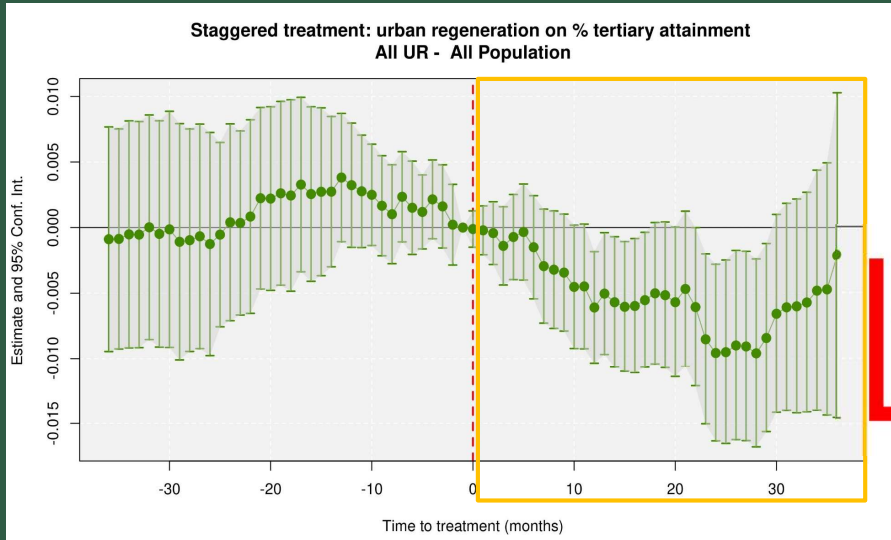
Mostly no – but it also doesn't look like they're getting worse:



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# Some of it seems to get worse

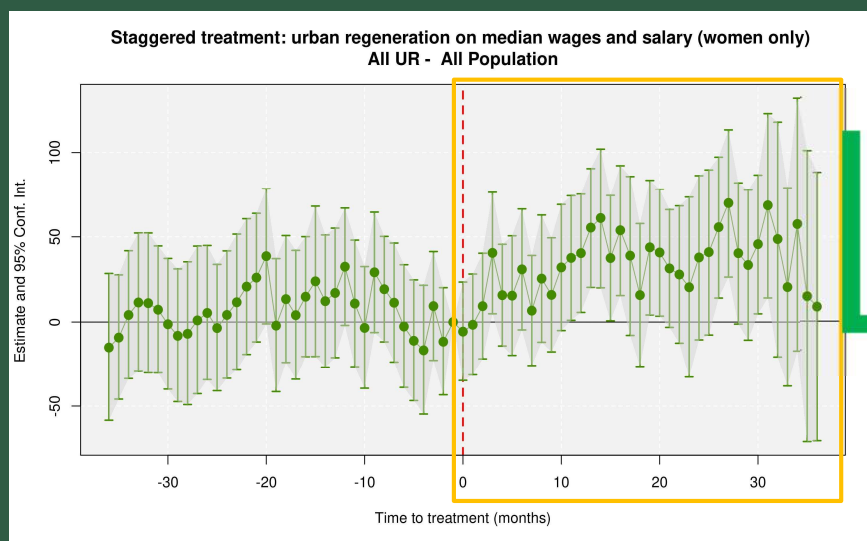
The % of the population with tertiary attainment decreases over time compared to control



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# But some things appear to be getting better!

Median wages and salary for women in treated areas increased over time compared to wages and salary for women in control areas

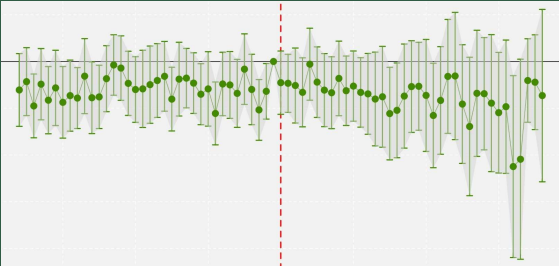


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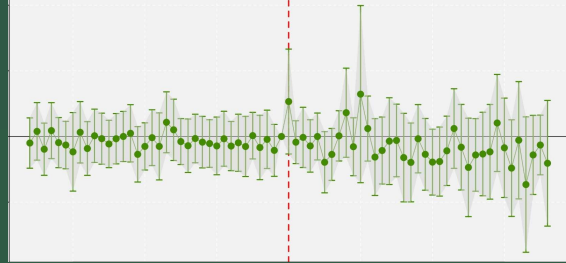


# MAYBE IN MY BACKYARD (M.I.M.B.Y)

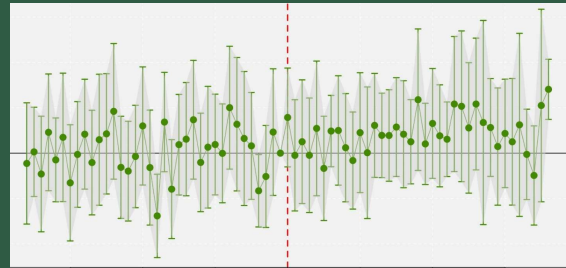
Theft victimisations not significantly higher compared to those living in control areas



Non-social housing residents are not assaulted more than those living in control

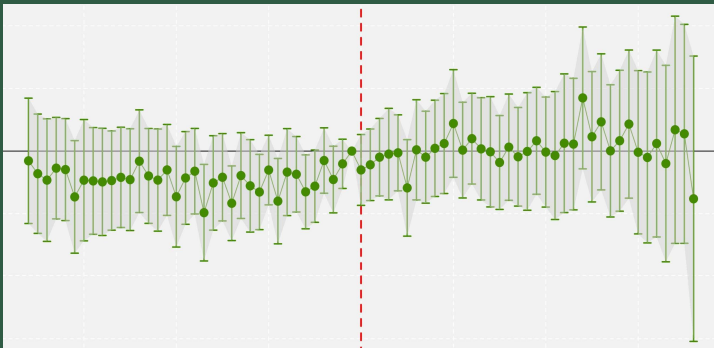


And same for robbery victimisations



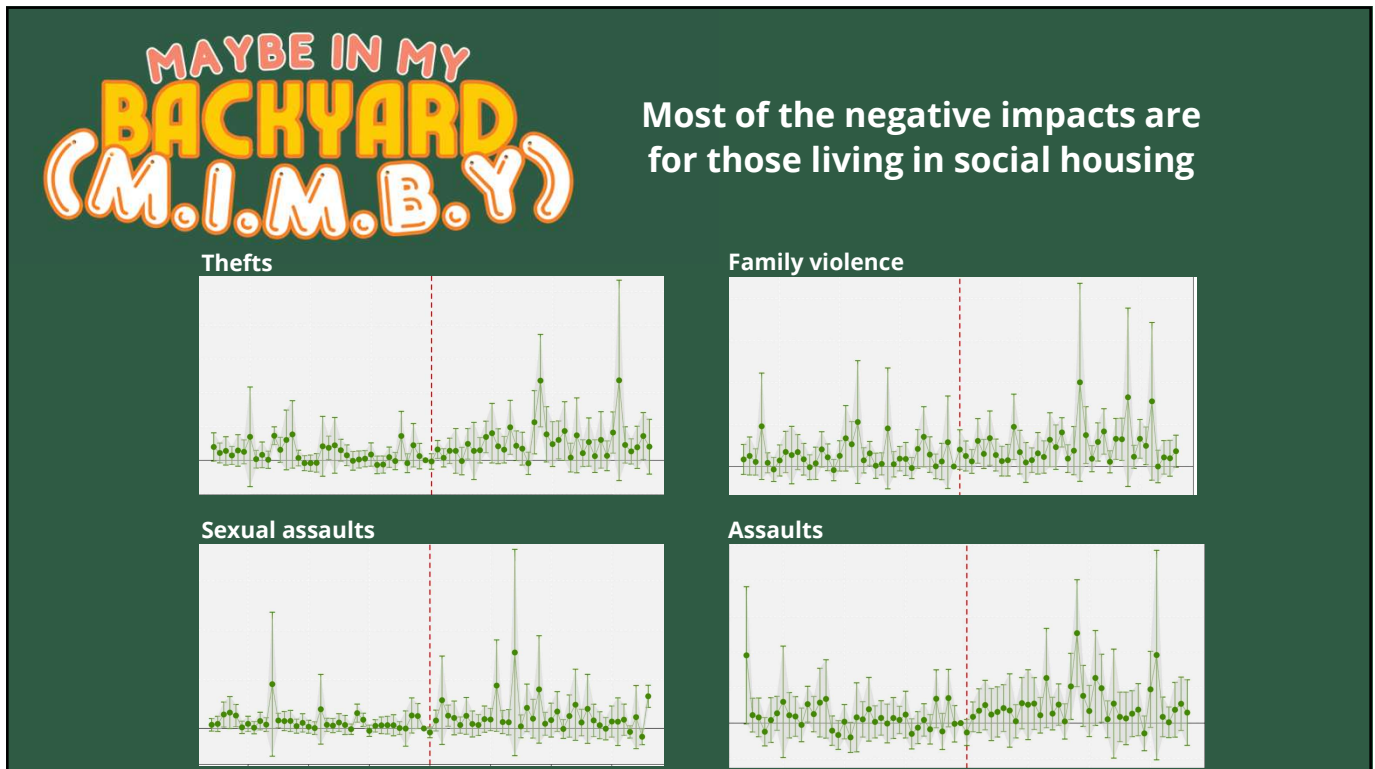
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# MAYBE IN MY BACKYARD (M.I.M.B.Y)



Mental health seems unchanged compared to control areas

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## Individual-level analysis

- Are neighbourhoods being gentrified so newcomers with better outcomes moving in?
- Are things improving because people who would have contributed to worse outcomes moving away?
- Or those who would have contributed to better outcomes moving away due to ongoing urban development/social housing?
- Or are long-term residents benefitting from urban regeneration?
- Social housing tenants are moving in but what are the characteristics of the other tenants moving in or away from treated areas?

**Analysis is currently underway to understand how wellbeing impacts are distributed among the population.**

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## SECTION FIVE

# CONCLUDING REMARKS



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## Current state

- First-order effects are modest – treatment is not yet complete, excluded a lot of pre-treated areas and not enough time has elapsed to assess longer-term effects
- As a result, wellbeing outcomes are mostly non-significant
- Non-social housing don't appear to be impacted by increased urban development and social housing
- Social housing tenants still poorer wellbeing outcomes compared to the general populace

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## Next steps

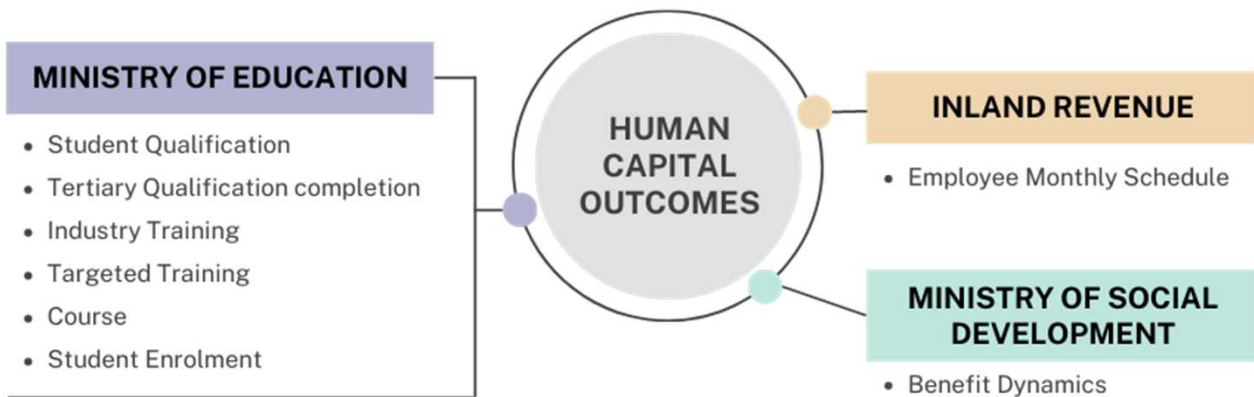
- The individual-level analysis is underway – looking at leavers, newcomers, long-term residents, broken down by social housing and non-social housing (few hundred more regressions to go)
- Individual-level analysis will help understand how wellbeing impacts are distributed among subpopulations
- Feel free to read my 200+ page thesis when it's submitted if you have any burning questions I cannot answer at this stage

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**Thank you**

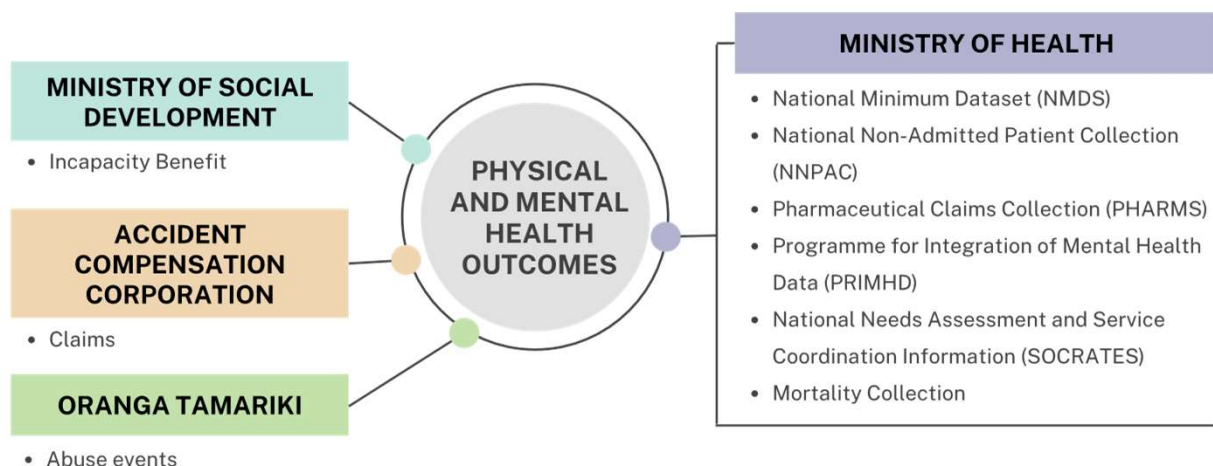
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## Appendix - Wellbeing indicators



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## Appendix - Wellbeing indicators



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# Appendix - Wellbeing indicators

