



# Making Insurance and Retrofit Work Together

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with huge thanks to:

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*Role of Disaster Insurance in Improving Resilience: An Expert Meeting*  
*Earthquake Insurance Panel 2*  
*July 10, 2015*



# 1. We need both insurance and retrofit

## INSURANCE

- Spreads economic loss
- Provides \$ for recovery
- Removes tail of loss dist.

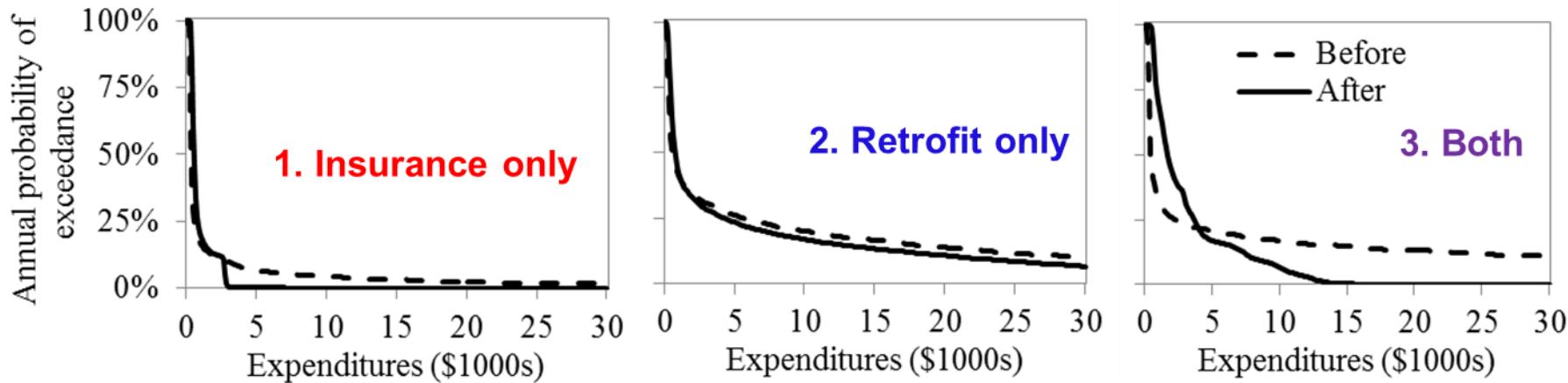
## RETROFIT

- Reduces economic loss
- Reduces casualties
- Lowers loss distribution

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## *Interactions*

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# Christchurch, NZ example

- Heavily insured. 80% paid by insurance.
- 17 events with 500k+ residential claims over 2 years
- Land covered

## BENEFITS

- Facilitating major rebuild
- \$12B paid by insurance

## CHALLENGES

- Extra demolitions (CBD)
- Apportionment
- Human resource needs
- Changes during rebuild
- Psychological effects
- Disruption during rebuild <sup>2</sup>



# 1. We need both insurance and retrofit

## ECONOMIC PERSPECTIVE

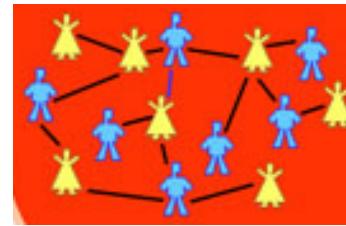
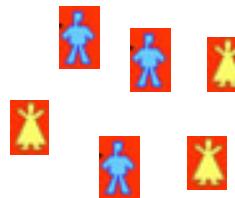
Damage covered by insurance = No damage

## COMMUNITY RESILIENCE PERSPECTIVE

Damage covered by insurance <<< No damage



## 2. Points to consider in policies & programs



- Balance system-individual views
  - Each stakeholder acts in own interest → societal result
  - Interactions among stakeholders
- Insurance and retrofit linked
- Depends on magnitude, nature of risk and possible retrofits
- Normative and descriptive aspects



# Factors affecting homeowner decision-making

## HOMEOWNER ATTRIBUTES

- Psychological
- Hazard experience
- Caregiver responsibility
- Demographics

## HOME ATTRIBUTES

- Appropriate retrofits
- Value
- Attachment to place

## RISK

- Model-estimated
- Perceived
- Likelihood
- Consequences
- Framing

## ADJUSTMENT ATTRIBUTES

- Cost in dollars, time, effort
- Efficacy in protecting property/people
- Usefulness for other purposes

## COMMUNITY/SOCIAL

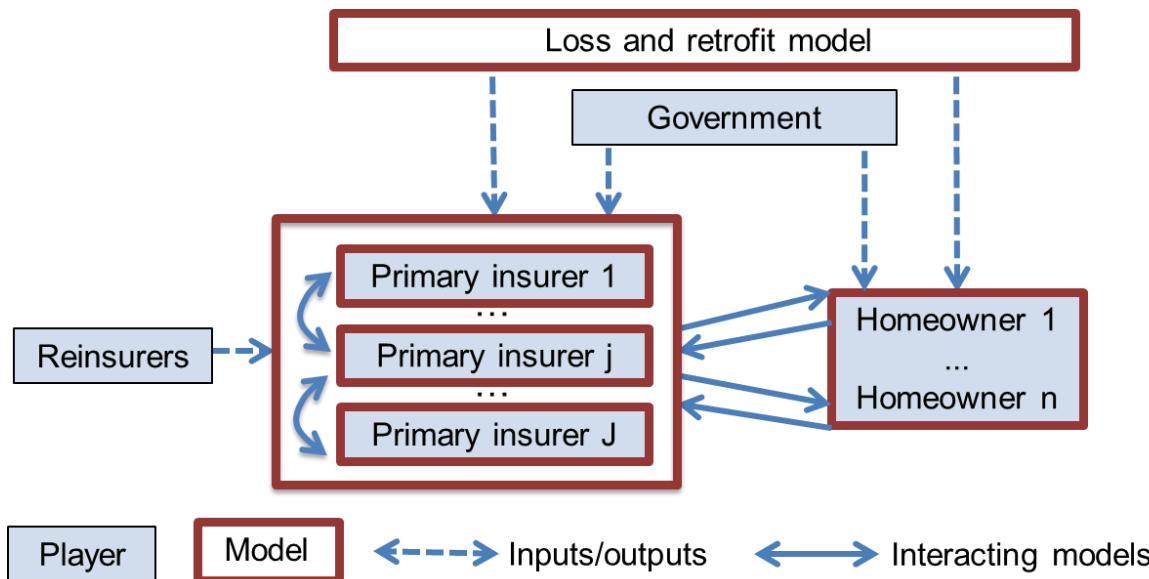
- Neighbors' actions
- Responsibility to prepare
- Expected response by others
- Community mitigation

*Multiple disciplines  
Heterogeneous  
1<sup>st</sup> engage*



### 3. Aim to design policies and programs that benefit everyone

- Do there have to be winners and losers? Sacrifices for societal good?
- Maybe not – Can reduce total losses → In everyone's interest
  - Exploit different objectives, constraints, abilities

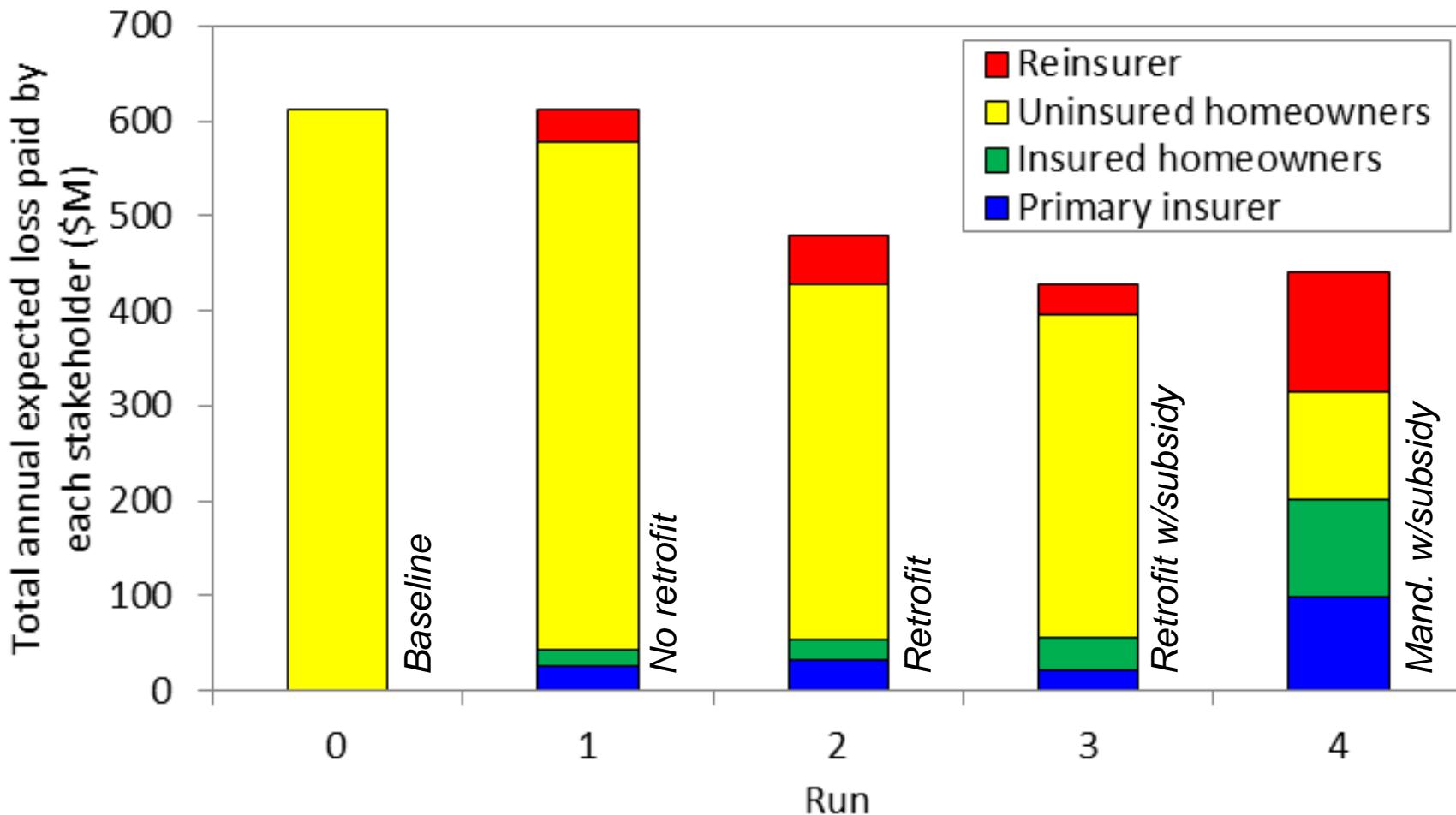




- 1 No retrofit
- 2 Retrofit
- 3 Retrofit w/subsidy
- 4 Mand. ins. w/subsidy

# Societal perspective

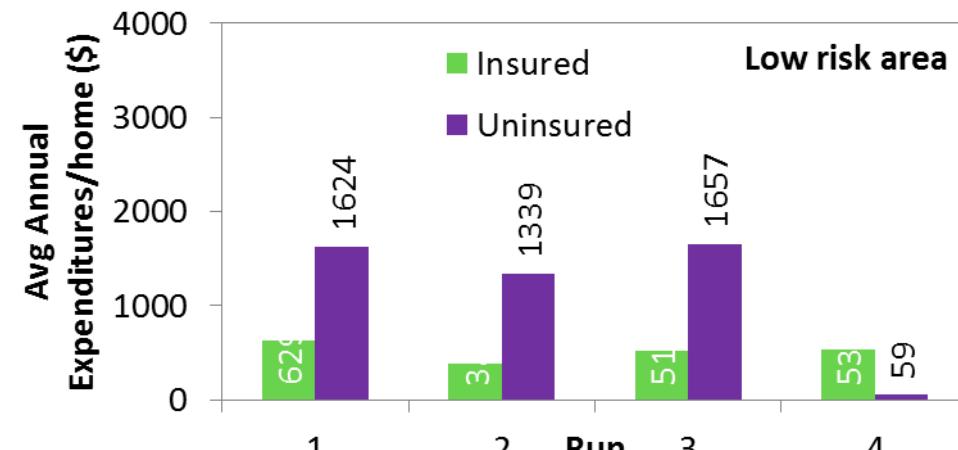
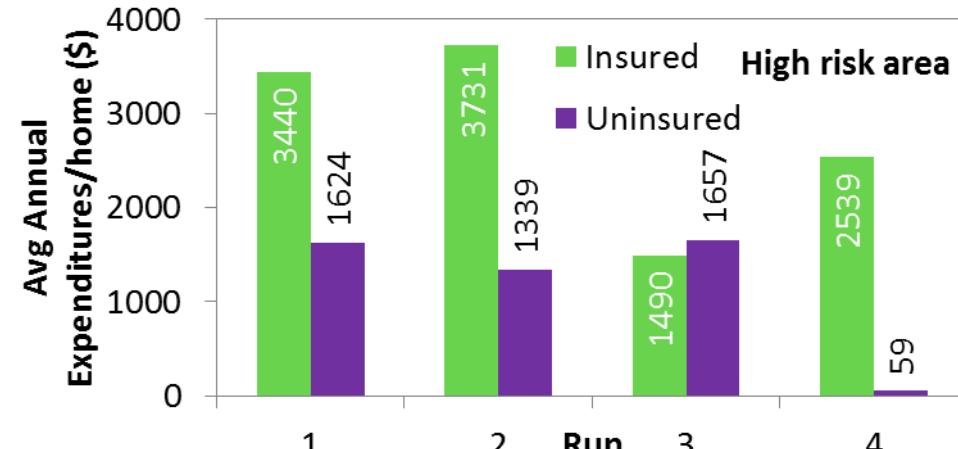
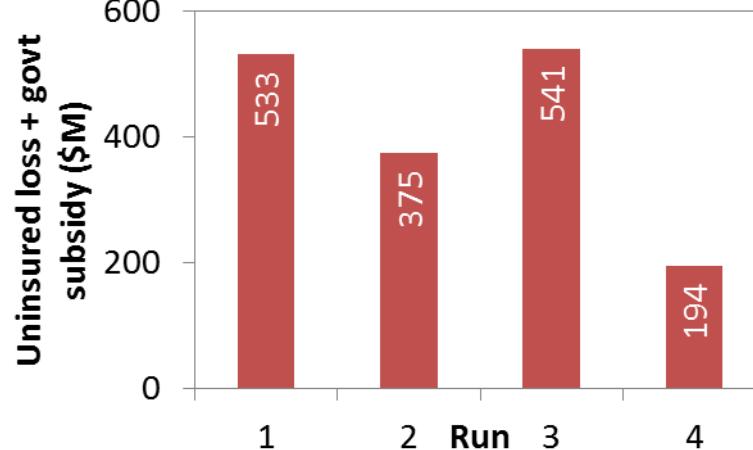
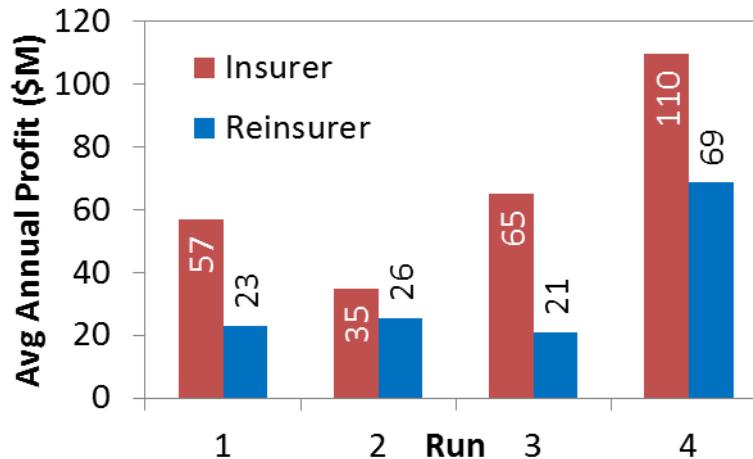
## Who pays?





- 1 No retrofit
- 2 Retrofit
- 3 Retrofit w/subsidy
- 4 Mand. ins. w/subsidy

## Stakeholder perspectives In each group's interest





# Acknowledgements



Peng et al. 2014. Modeling the integrated roles of insurance and retrofit in managing natural disaster risk: a multi-stakeholder perspective. ***Natural Hazards*** 74, 1043-1068.

Kesete et al. 2014. Modeling insurer–homeowner interactions in managing natural disaster risk. ***Risk Analysis*** 34(6), 1040-1055.

Gao Y. et al. Modeling competition in a market for natural catastrophe insurance, ***Journal of Insurance Issues***, in press.