



The impact of in-house unnatural death on property values: Evidence from Hong Kong

Zheng Chang^{a,*}, Jing Li^b

^a Department of Architecture and Civil Engineering, City University of Hong Kong, 6/F, Academic 1 Building, Tat Chee Avenue, Kowloon, Hong Kong SAR

^b School of Economics, Singapore Management University, 90 Stamford Road, 178903, Singapore

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ABSTRACT

The occurrence of in-house unnatural death could negatively affect the value of housing property. This study evaluates the geographic and temporal scope of the impact of unnatural death on property values in Hong Kong. By exploiting the spatial and intertemporal variation of the shock in a difference-in-differences approach, we find significant negative externalities of unnatural death incidence on neighborhood housing values. On average, units in which an unnatural death occurred experience a 25% drop in value following the death. Nearby units on the same floor also show a significant price drop of 4.5%. Prices of units on other floors of the same building decline about 2.6%. Units in other buildings of the same estate observe a price decline of about 1% on average. However, the price for nearby estates within 300 m shows a positive impact of 0.5%, suggesting a very localized sorting mechanism. Temporally, price evolution after death incidence follows a U shape. Housing prices continue to decline up to 4–5 years after deaths and recover gradually afterwards. We also document the heterogeneity of the impact by the type of death incidence (murder, suicide, or accident) and the type of homebuyers (local buyer, investment firm, and other buyers). We find that the negative externalities of death incidence are largely due to a severe stigma effect, rather than channels through the revealed crime risk or the price contagion effect.

1. Introduction

Households choose where to live and which units to buy by assessing a bundle of housing attributes. Aside from commonly observed features, like floor space, number of rooms, and nearby amenities, many intangible features, such as perceived neighborhood crime risk, attitudes toward a certain ethnic group, and psychological perceptions of stigma tagged to a unit, also play a significant role in affecting a household's preference for the unit. Among the latter type of features, information revealed on previous in-house unnatural deaths could substantially reduce the willingness to pay for a unit as well as other units in close proximity. This outcome could be because (1) unnatural deaths, especially those resulting from violent crimes, reveal high crime risks associated with the neighborhood; (2) in-house deaths could generate prolonged externalities associated with the death stigma, having a negative psychological impact on those living in close proximity; and (3) shocks imposed on the price of a particular unit may create contagion effects that affect nearby housing values.

There is extensive literature documenting households' averting behavior against revealed crime risk and/or potential stigma effects that

follow the revealed risk. For example, Linden and Rockoff (2008) and Pope (2008) show that house values fall by 2.3–4% following the move-in of a registered sex offender in close proximity. Congdon-Hohman (2013) and Dealy et al. (2017) find that house prices drop substantially following the discovery of a methamphetamine lab and a long-lasting stigma effect remains even after the decontamination of those labs. However, few studies thus far have considered the direct impact of unnatural deaths on nearby property prices, even though such deaths occur at high frequency, are often connected to crime or suicide, and generate substantial neighborhood disruptions. In particular, deaths from violent crimes trigger strong emotional disturbance and disperse fears about possible murders in the community. In addition, unnatural deaths from suicide might have a strong physiological impact on a neighborhood especially one in which there are strong beliefs in ghosts and the afterlife.

So (2007) analyzes the externalities of unnatural death on properties values by using seven large-scale housing estates in Hong Kong from 1991 to 2006. Although he finds negative effects of unnatural death on property values, his hedonic regression method is likely to yield biased results, as unnatural deaths are likely to correlate with unobservable

* Corresponding author.

E-mail addresses: zchang@cityu.edu.hk (Z. Chang), lijing@smu.edu.sg (J. Li).

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factors of housing estates. [Bhattacharya et al. \(2017\)](#) adopt a difference-in-differences (DID) approach to estimate the negative effect of haunted houses on nearby houses within major large-scale estates in Hong Kong. The authors also find negative externalities of unnatural deaths, and some of their main findings are consistent with our estimation in this study. However, their estimation largely focuses on short-run effects. They also ignore multiple treatment issues, which could underestimate the real effect. Our study overcomes these weaknesses and provides a more comprehensive understanding of the geographic and intertemporal scope and mechanism of housing externalities caused by unnatural death incidence. Given the similarities between our study and [Bhattacharya et al. \(2017\)](#), we provide a detailed comparison between these two studies in appendix [Table A1](#).

Specifically, our study examines (1) the geographic scope of the long-run impact of unnatural death within and beyond housing estates; (2) how the market response following unnatural deaths evolves temporally; and (3) how unnatural deaths resulting from different types of death and different types of homebuyers lead to different extent of housing market responses. Aside from these main questions, this study also explores whether housing price variations are likely caused by the following three channels: risk awareness, the stigma effect, or the price contagion effect.

The analysis relies on comprehensive data on housing transactions and unnatural deaths in Hong Kong spanning the period 2001 to 2015. The data contain detailed information on housing units and location characteristics as well as households' characteristics. Linked with publicly released information on the incidence of in-house unnatural deaths, we are able to explore the housing market outcomes in response to the occurrence of unnatural deaths from various perspectives. The geographic scope of the data allows us to explore the extent to which the impact varies with spatial features captured by residential density. The long time horizon of the data allows us to explore the temporal pattern of the market responses over an extended period.

We adopt various specifications in a difference-in-differences setting that explores both intertemporal and geographic variations in the shock to identify its impact. One potential threat to the identification of the causal impact is the endogeneity of the shock. For example, if the death incidence is more likely to occur in a neighborhood that is deteriorating over time, the fall of house prices following the shock could reflect the deviating trend between the treatment and control neighborhoods. We argue that the occurrence of unnatural deaths is not a consequence of high-risk individuals sorting into more vulnerable neighborhoods. In particular, we control for building fixed effects in our empirical analysis and show that the geographic scope of the impact is contained within a small cluster of buildings. It is difficult to believe that high-risk individuals would sort into a particular floor level given the thinness of the housing market. This is in line with [Bayer et al. \(2008\)](#) in identifying the peer effect on labor market outcomes.

We obtain the following findings: housing values drop about 25% for units with deaths, 4.5% for other units on the same floor, 2.6% for other floor units in the same building, and 1% for units in other buildings of the same estate. However, the average house price of units in other estates within 300 m increases 0.5%. For units with deaths, the price decline is sustained across the whole study period. The price impact on units in other geographic scopes follows a U shape and starts to reverse after 4–5 years of a death. The impact is significantly different by type of death, and type of homebuyer. Lastly, we explore the mechanism of the price variation caused by the unnatural death incidence, and find that the impact is largely from the stigma effect rather than other channels.

The evidence documented in this study contributes to the literature in a number of ways. First, it quantifies the social impact of a direct and striking signal of social disturbance—unnatural deaths of local residents. These incidences cause uneasiness about living in the neighborhood, especially for those deaths resulting from murder and suicide. Death incidence leads to spatially concentrated responses but long-lasting temporal impacts. Given the durable nature of housing, the long-run supply of housing tends to be perfectly inelastic when facing reduced

demand. In this case, market response generates sharp equilibrium price drops even after a long time horizon ([Glaeser and Gyourko, 2005](#)). With proper controls, an accurate measure of the long-run effect is essential for a better understanding of the aggregate social cost following the occurrence of in-house unnatural death.

Second, our findings complement the literature on housing externalities/spillovers. Housing prices may be affected by nearby properties through urban revitalization ([Rossi-Hansberg et al., 2010](#); [Hornbeck and Keniston, 2017](#)), cessation of rental control ([Autor et al., 2014](#)), crime risk ([Linden and Rockoff, 2008](#)), forced sales ([Campbell et al., 2011](#)), and so forth. The difference between our study and others is that we emphasize the psychological impact on nearby property value. Although the role of psychology in affecting the behavior of investors has been well studied in the past 2 decades, most studies have focused on high-liquid assets, such as stocks ([Shiller, 2003](#); [Thaler, 2006](#)). Even though housing is one of the most important asset classes, research on psychological impact on the housing market remains rare. Our study aims to fill the gap in this field.

Third, this study is related to the literature identifying the hedonic price function for local (dis)amenities, such as school quality, pollution, crime, and property taxes, by exploiting a quasi-experimental design ([Black, 1999](#); [Lynch and Rasmussen, 2001](#); [Bui and Mayer, 2003](#); [Chay and Greenstone, 2005](#)). One major obstacle in identifying such hedonic prices is that variation in these location-specific features may be correlated with unobservable factors that also affect housing prices. In this case, the estimated hedonic prices in a simple cross-sectional setting reflect the impact of both the key feature of interest and other unobserved factors, which leads to either upward or downward bias. This study explores a plausible exogenous shock to the housing market in identifying the impact of unnatural deaths on housing market outcomes in a difference-in-differences setting. The evidence indicates that this factor explains a significant variation in housing prices within the geographic and temporal scope of the shock.

The rest of this paper is organized as follows. Section 2 introduces the housing market structure and psychological background in Hong Kong. Section 3 describes the data and summary statistics. Section 4 performs a number of examinations on the effect of unnatural death incidence on property values. Section 5 offers a number of robustness checks to verify our empirical results. Section 6 explores the mechanism of the death incidence on housing prices. Section 7 concludes.

2. Hong Kong's housing market and psychological background

2.1. Housing market in Hong Kong

Hong Kong was ranked the most expensive housing market from 2011 to 2017 by the annual Demographia International Housing Affordability Survey.¹ These high housing prices are largely determined by the city's housing supply shortage relative to demand. In 2016, about 7.3 million people lived within a 1100-square kilometer territory. Geographically, the city is surrounded by the South China Sea from the east, south, and west. The north of the city borders Shenzhen, one of the mega cities in mainland China. As 80% of Hong Kong is mountainous with natural parks, its developed area accounts for only 24% of the territory, and the residential land use accounts for about 7% of the land ([Planning Department of Hong Kong, 2016](#)). Moreover, the city's land supply is driven largely by economic and political considerations rather than housing market prices ([Chiu, 2007](#)). The geographical constraint and inelastic land supply certainly contribute to the city's expensive housing ([Glaeser et al., 2005](#); [Saiz, 2010](#)).

To protect the interests of low-income residents, the Hong Kong

¹ The reports of the annual Demographia International Housing Affordability Survey can be found in the following link: <http://www.demographia.com/dhi.pdf>.

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