



ESCUELA POLITÉCNICA NACIONAL
VICERECTORADO DE INVESTIGACIÓN Y PROYECCIÓN SOCIAL
DIRECCIÓN DE INVESTIGACIÓN Y PROYECCIÓN SOCIAL

PROYECTO DE INVESTIGACIÓN

Proyecto Interno Proyecto Semilla Proyecto Junior Proyecto Multi Inter Disciplinario

Investigación Básica Investigación Aplicada Investigación Pedagógica Innovación

DEPARTAMENTO(S):

1. Matemática

LINEA(S) DE INVESTIGACIÓN:

1. Modelización en Economía y Finanzas

1 Proyecto de Investigación

Título: Effects of Overcrowding on Children's Height and Physical Health

Resumen del proyecto (máximo 200 palabras)

It has empirically demonstrated that too many people living under the same roof reduces living quality. According to literature (Crothers et al 1993, Gove et al 1979, Jazwinski 1998, Goux and Maurin, 2005) people who live in overcrowded housing suffer from not being able to control outside demands. It is impossible for them to have the necessary minimum amount of quiet time they need for their personal development. Additionally, the majority of literature about the consequences of overcrowding comes from the medical branch. Medical literature has shown great interest in the health of people living in overcrowded conditions. Then, it has been proved that individuals living or having lived in such conditions are sick more often than others, specially due to tuberculosis (Baker, 2008, Clark et al 2002) and respiratory insufficiency and pulmonary problems (Britten et al., 1987, Rasmussen et al., 1978, Mann et al., 1992). There is such effect on health that generally people who grow up in overcrowded housing die at a younger age than others (Coggon et al., 1993, Deadman et al., 2001), most notably of cancer (Barker et al., 1990). If we consider mental health, literature shows people from overcrowded households have less well-being (Riva, 2014). Consequently, in this research proposal what we want to know is what are the effects of housing overcrowding on Ecuadorean children, especially on their height and the persistence of respiratory and stomach diseases by using econometric techniques.

Palabras clave (4-6): overcrowding, crowding, effects, children, Ecuador.

2 Datos personales y académicos del Director del Proyecto



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UNIDAD DE PROYECTOS

Quito a.

27 OCT 2015

HORA
15:26

CARLOS CALDERÓN



5	<p>Objetivos, relevancia, productos y resultados esperados de esta propuesta de investigación</p> <p>5.1 Objetivos</p> <p>5.1.1 Objetivo General</p> <ul style="list-style-type: none">• To identify the effect of housing overcrowding on children's well-being <p>5.1.2 Objetivos Específicos</p> <p>a. To verify what are the nature and intensity of the adverse effects of overcrowding on children's height and persistence of chronic respiratory and stomach chronic diseases.</p> <p>b. To determine what are there factors that mediate the likelihood of adverse effects, such as information, personal hygiene, and cultural behaviors.</p> <p>c. To define if it is possible to isolate the effects of crowding from other related factors on children's wellbeing</p> <p>5.2 Relevancia de esta propuesta de investigación y su relación con la(s) Línea(s) de investigación asociadas.</p> <p>The relevance of this research proposal is given by the fact that using econometric modelling techniques, we want to study the effects of housing overcrowding in one of the most important population segments: children. Additionally, it is important to mention that housing overcrowding effects have not been studied yet in Ecuador, so this research would be pioneer on this topic.</p> <p>5.3 Productos esperados</p> <table><tr><td>a. Publicaciones científicas (obligatorio);</td><td><input checked="" type="checkbox"/></td></tr><tr><td>b. Disertación a la Comunidad Politécnica;</td><td><input checked="" type="checkbox"/></td></tr><tr><td>c. Proyecto de Titulación;</td><td><input type="checkbox"/></td></tr><tr><td>d. Tesis de Grado (maestría o doctorado);</td><td><input checked="" type="checkbox"/></td></tr><tr><td>e. Aplicación tecnológica construida o implementada;</td><td><input type="checkbox"/></td></tr><tr><td>f. Patente presentada;</td><td><input type="checkbox"/></td></tr><tr><td>g. Perfil de proyecto de mayor impacto científico, técnico, pedagógico o de innovación.</td><td><input type="checkbox"/></td></tr></table> <p>5.4 Detalle de los resultados esperados (con relación a los objetivos)</p> <p>a. We expect that after controlling other factors, we can isolate and quantify the causality relationship of overcrowding on children height</p> <p>b. We also expect to verify if there are variables that mediate the likelihood of negative effects of overcrowding on children. This variables can be related to personal hygiene and cultural behaviors.</p> <p>c. Last but not least, we expect to propose public policies in order to diminish the effect of overcrowding on children's health.</p>	a. Publicaciones científicas (obligatorio);	<input checked="" type="checkbox"/>	b. Disertación a la Comunidad Politécnica;	<input checked="" type="checkbox"/>	c. Proyecto de Titulación;	<input type="checkbox"/>	d. Tesis de Grado (maestría o doctorado);	<input checked="" type="checkbox"/>	e. Aplicación tecnológica construida o implementada;	<input type="checkbox"/>	f. Patente presentada;	<input type="checkbox"/>	g. Perfil de proyecto de mayor impacto científico, técnico, pedagógico o de innovación.	<input type="checkbox"/>
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6 Descripción, metodología y cronograma de trabajo



6.1 Descripción, metodología y diseño del proyecto (Máximo dos carillas)

It has empirically demonstrated that too many people living under the same roof reduces living quality. According to literature (Crothers et al 1993, Gove et al 1979, Jazwinski 1998, Goux and Maurin, 2005) the problems caused by lack of living space are conceptualized as the consequences (a) of an excess of interactions, stimulations and demands from the people living in the immediate area, and (b) of a lack of intimacy and the possibility of being alone.

It has been proved that individuals living or having lived in such conditions are sick more often than others, specially due to tuberculosis (Baker, 2008, Clark et al 2002) and respiratory insufficiency and pulmonary problems (Britten et al., 1987, Rasmussen et al., 1978, Mann et al., 1992). There is such effect on health that generally people who grow up in overcrowded housing die at a younger age than others (Coggon et al., 1993, Deadman et al., 2001), most notably of cancer (Barker et al., 1990). If we consider mental health, literature shows people from overcrowded households have less well-being (Riva, 2014). Goux and Maurin (2005) indicate that there are many reasons for these health problems and their persistence. Living in an overcrowded space is a source of stress and favors illnesses linked to anxiety. The members of a family living in a crowded space also transmit their infections to one another more easily, weakening their immune systems. These authors indicate that living in an overcrowded space puts people at greater risk to problems linked to poor ventilation and hygiene conditions, such as poisoning caused by the smoking of one or more family members.

In overcrowded household situation, Goux and Maurin (2005) found that occupants' health is at greater risk and their capacity for intellectual concentration decreases, then it is clear that a lack of space is a potentially unfavorable factor for children's success at school. Additionally, the negative effects of overcrowding, according to literature, are even stronger in population minorities like black or indigenous people (Bailie and Wayte, 2006) and children has well. In the case of children, stress, lack of space and privacy could affect its normal development (Goux and Maurin, 2005). In the case of physical development, it could affect children's height. According to Nestlé (2007), short or tall stature is primarily a normal variation of height. It is part of the continuum of the normal Gaussian distribution curve which defines the lower and upper limit of normal as the 3rd and 97th percentile. Within this context it is very important to differentiate normal variations in height and growth from pathological conditions. According to Nestlé (2007), normal variations in height are familial and idiopathic short or tall stature. Normal variations in growth are diagnosed as constitutional acceleration or constitutional delay of growth and puberty and are observed on all percentiles.

Bearing in mind this literature background, we want to verify the effects of overcrowding in the height of children household members, which there seems not to be literature exploring this specific topic, but health in general (The United Kingdom Office of the Deputy Prime Minister, 2004).

Regarding the data base, we plan to use the two last Living Conditions Surveys available in Ecuador (2006 and 2014). Since we want to verify the effects -consequences- of overcrowding at individual level, then we plan to verify them on height of the household children; first, since there is no literature about the effects of overcrowding on children's height, we propose to estimate the following equation using OLS:

$$\log(\text{height}_i) = \beta_0 + \beta_1 \text{Overc}_i + \beta_2 \text{Age}_i + \beta_3 \text{Gender}_i + \beta_4 \text{Weight_at_birth}_i + \beta_5 \text{Height_at_birth}_i + \beta_6 \text{Breast_Feeding}_i \\ + \beta_7 \text{Vitamin_A}_i + \beta_8 \text{Iron}_i + \beta_9 \text{Ethnic}_i + \beta_{10} \text{Educ}_i + \beta_{11} \text{Income}_i + \beta_{12} \text{Age_Hh}_i + \beta_{13} \text{Age_Sq_Hh}_i + \beta_{14} \text{AIDS}_i \\ + \beta_{15} \text{Tetanus}_i + \beta_{16} \text{Wash_hands}_i + \beta_{17} \text{Cleaning_Prods}_i + \beta_{18} \text{Smoke}_i + \beta_{19} \text{Area}_i + \beta_{20} \text{Region}_i + u_i$$

Additionally, in the 2014 data base, we have additional information related to children that could be interesting for our research purposes. Specifically, the questions: did the child have diarrheic chronic disease last month? And, did the child have respiratory chronic disease last month? Since the answers are dichotomy ones (yes/no), we can construct two additional models, one for each question that will become our dependent variable, in order to verify the effects of overcrowding on children

References:

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- Baker, M D. Das, K. Venugopal, and P. Howden-Chapman (2008). Tuberculosis Associated with Household Crowding in a Developed country. *Journal Epidemiol Community Health* 62. P.p. 715-721.
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- Clark, M., Riben, P., Nowgesic, E. (2002) The association of housing density, isolation and tuberculosis in Canadian First Nations communities. *Int J Epidemiol* 31:940-943.
- Goux, D. and Maurin, E. (2005). The effect of overcrowded housing on children's performance at school. *Journal of Public Economics* 89. 797-819.
- Mann, S.L., Wadsworth, M.E., Colley, J.R. (1992). Accumulation of factors influencing respiratory illness in members of a national birth cohort and their offspring. *Journal of Epidemiology and Community Health* 46,286-292.
- Rasmussen, F.V., Borchsenius, L., Winslow, J.B., Ostergaard, E.R. (1978). Associations between housing conditions, smoking habits and ventilatory lung function in men with clean jobs. *Scandinavian Journal of Respiratory Disease* 59, 264-276.



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Riva, M. Lytken Larsen, C., Bjerregaard, P. (2014). Household Crowding and Psychosocial Health among Inuit in Greenland. *International Journal of Public Health* 59:739-748.

Silva N, Bullinger M, Quitmann J, Ravens-Sieberer U, Rohenkohl A, Qo LG. (2013) HRQoL of European children and adolescents with short stature as assessed with generic (KIDSCREEN) and chronic-generic (DISABKIDS) instruments. *Expert Rev Pharmacoecon Outcomes*.

The United Kingdom Office of the Deputy Prime Minister (2004). "The Impact of Overcrowding on Health & Education: A Review of Evidence and Literature." Office of the Deputy Prime Minister Publications.

6.2 Cronograma de trabajo anual: (Descripción)

- Para la elaboración del cronograma de ejecución del proyecto se sugiere considerar el tiempo para la adquisición de equipos, reactivos y materiales de laboratorio.

Actividad	Primer Año						TOTAL
	Porcentaje de avance por mes						
	1-2	3-4	5-6	7-8	9-10	11-12	
Revisión de Bibliografía especializada	15						15
Recolección de Datos		15					30
Primeros Modelaciones			20				50
Análisis de Resultados				25			75
Levantamiento de Textos					10	15	100
TOTAL							

Actividad	Segundo Año 2						TOTAL
	Porcentaje de avance por mes						
	1-2	3-4	5-6	7-8	9-10	11-12	
TOTAL							

7 Fechas de inicio y fin

Desde Octubre del 2015 hasta Septiembre del 2016.

8 Tiempo de dedicación de docentes, infraestructura, equipos y fondos adicionales.



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8.1 Tiempo máximo de dedicación semestral del Director del proyecto, de los docentes participantes y otros colaboradores.

El tiempo de dedicación será el máximo que se permite para el director, en este caso, de proyecto interno, es decir, 16 HSS.

8.2 Infraestructura y equipos

- *El proyecto sería llevado a cabo en el espacio físico destinado a oficina del director del proyecto que está en el 7mo piso del ala norte del Edificio de Administración. Actualmente se dispone de un computador DELL con procesador CORE i7, dos escritorios y dos sillas*

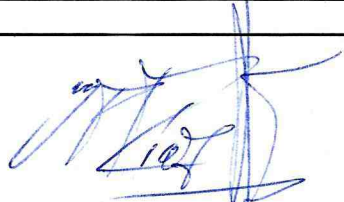
8.3 Breve justificación del equipo requerido

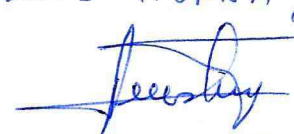
- *El equipo que se requiere es básicamente un computador para el/la estudiante que sería asistente de investigación en el proyecto para que puedan trabajar tanto director como asistente de proyecto simultáneamente.*

8.4 Fondos Adicionales

- *No Aplica.*

9	Presupuesto estimado para la ejecución del presente proyecto (anual)			
	<ul style="list-style-type: none">- <i>Los costos para la elaboración del presupuesto estimado no deben incluir IVA.</i>- <i>Las maquinarias y equipos deberán tener una proforma local con un representante autorizado en el país.</i>- <i>En el caso de PIMI, se deberá aclarar en cual departamento permanecerán las maquinarias y equipos</i>			
	<u>Primer Año</u>			
	Lista de ítems		Cantidad solicitada (US \$)	Porcentaje (%)
	1. Contratación Servicios Personales por Contrato <i>Ayudantes de Investigación</i>			
	Subtotal		1300	29,54
	2. Maquinaria y Equipos			
	Subtotal		800	18,10
	3. Reactivos y materiales de laboratorio			
	Subtotal			
	4. Literatura especializada		500	11,36
	Subtotal			
	5. Viajes técnicos y de muestreo			
Subtotal				
6. Presentación de ponencias en congresos internacionales y publicaciones		1800	41	
Subtotal				
TOTAL PRESUPUESTO		4400,00 + IVA /	100	

10	Lugar y Fecha / Firma del Director del Proyecto	
	Quito, 27 de Octubre del 2015 Nombre: Juan Pablo Díaz Sánchez CC: 1804033361	 Firma del Director

Aprobada por LUIS HORNA, jefe departamento de Matemática

2015-10-27 ✓