The spatial gradient of well-being - A global assessment

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Motivation (I)

- Rich history of OECD work on well-being

- OECD Better Life Index (multidimensional: jobs, income, health, education, etc.).

- OECD Regional Well-Being Database (large regions)

- Recent and ongoing work: Smart Cities and Well-Being, Sustainability and Circular Economy

- So far missing: systematic international analysis of spatial or city-rural differences in well-being or quality of life

Motivation (II)

Motivation (III)

- The fundamental trade-off of urban economics (Fujita & Thisse, 2013) clearly highlights that the benefits of urban areas come together with costs.

- If we measure the welfare and progress of societies only through economic indicators (GDP), urban areas are clearly better off than rural ones.

- Several initiatives aimed at advancing the statistical agenda on the measurement of progress propose to look at a multitude of sound well-being indicators, accounting for the different dimensions of people's lives, from those related to material conditions, such as income, jobs and housing affordability, to those related to "quality of life".

- Subjective well-being measures can generalise to aggregate levels of well-being and they are valued by both individuals and policy makers (De Neve et al., 2013)

This paper:

- Based on the work of the OECD-EC report **Cities in the World**, which offers the first globally consistent assessment of urbanisation, its drivers and its consequences.

- It assesses differences in quality of life across different types of settlements at the global level.

- Besides the global scope of the analysis, the novelty of the paper consists of combining micro-data from a global survey with comparable human settlement definition across countries and looking across the rural-urban continuum, instead of being limited to the classic rural-urban distinction.

- We do so by combining individual data on life satisfaction coming from the Gallup World Pool with the Degree of urbanisation classification (Dijkstra & Poelman, 2014).

Research questions

RQ 1

Does subjective life satisfaction differ systematically between residents in different type of settlements?

RQ 2

Does the urban-rural gradient in perceived life satisfaction vary across different levels of economic development/income or World macro-regions?

RQ 3

Does the urban-rural gradient in perceived life satisfaction vary by city size?

Preview of results I

- People living in cities have consistently higher levels of life satisfaction than rural residents (baseline result: $+13.2\%$). Differences in life satisfaction hold after controlling for individual characteristics, although they become lower in magnitude (baseline: $+5.4\%$)

- Residents in towns and semi-dense areas show levels of personal life satisfaction between those of urban and rural residents.

Well-being

■ Rural areas ■ Towns and semi-dense areas ■ Cities

% satisfied with life
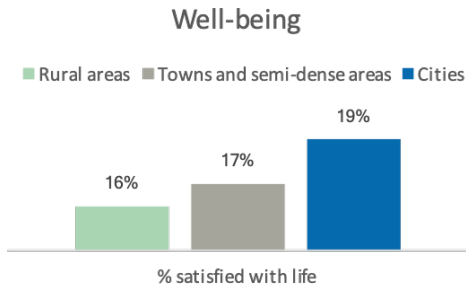
Preview of results II

- Those differences are particularly high in poorer and less developed countries, vary by World macro-regions and life satisfaction is also sensitive to city size.

- The heterogeneity in the results might justify the divergence of the results from the existing literature, mainly focused on single-country analyses. Indeed, looking at the US we do find a lower level of life satisfaction for city residents compared to rural ones, as previously documented.

Related literature

This paper contributes to the literature assessing spatial differences in self-reported well-being across space. <u>Mixed evidence</u>:

1. People in cities are on average less happy than inhabitants of towns, villages and rural areas → **Berry & Okulicz-Kozaryn, 2011** (US); **Knight & Gunatilaka, 2010** (China); **Sorensen, 2014** (Europe).

2. Other studies found no evidence of rural-urban happiness differences → **Valente & Berry, 2016** (Latin America); **Shucksmith et al., 2009** (Europe).

3. Heterogeneous results according to level of development/urbanisation → **Shucksmith et al., 2009** (Europe); **Lenzi & Perucca, 2018** (Europe); **Okulicz-Kozaryn, 2015** (US); **Chen et al., 2015** (China); **Easterlin et al., 2011** (World).

Overall, the mixed results available in the literature suggest that part of the differences in the results come from issues of definition of what is a city, an urban and a rural area.

Novelties and Contribution

- Global coverage of the analysis
  $\rightarrow$ important because of heterogeneity.

- Unique and consistent definition of human settlements
  $\rightarrow$ to avoid subjective and different administrative definitions of the area of residence.

- Urban-rural continuum definition
  $\rightarrow$ we capture the continuum between cities and rural areas and we provide a more nuanced perspective than the traditional urban-rural dichotomy.

Data (I) - Gallup dataset

- 2016 and 2017 waves of the Gallup World Poll
  $\rightarrow$ randomly selected and nationally representative samples.

- 163,464 respondents from 111 different countries (↦ Sample distribution)
  $\rightarrow$ information on personal well-being and socio-economic conditions

- Main variable of interest: self-reported life satisfaction (0-10).
  "Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time, assuming that the higher the step the better you feel about your life, and the lower the step the worse you feel about it? Which step comes closest to the way you feel?".

- The dataset contains many other well-being related variables and individual observable controls (age; gender; marital status; household size; education; employment status; annual income).

Data (II) - Degree of Urbanisation (Dijkstra & Poelman, 2014)

- Finest level of analysis (spatial detail of 1-square km).

- Based on population size and density and using population gridded data with global coverage.

- It makes it possible to classify the inhabited surface of the entire world into three categories:

  - ▶ **Cities**: clusters of contiguous cells with a population density of at least 1,500 inhabitants per square km and a total population of at least 50,000 inhabitants.

  - ▶ **Towns & semi-dense areas**: population density of at least 300 inhabitants per square km and a total population of at least 5,000.

  - ▶ **Rural areas**: all inhabited cells with population density lower than 300 inhabitants per square km not included in one of the two previous categories.

- Example: ▸ Map

Data (III) - Functional Urban Areas (OECD, 2012)

- We are also able to combine the geo-coded individual observations with the relative functional urban area (FUA), whose boundaries were estimated for the entire world by Moreno-Monroy, Schiavina and Veneri (2020).

- FUAs were jointly defined by the EC and the OECD to overcome the difficulties to compare cities and their respective commuting zones across different countries (OECD, 2012; Dijkstra, Poelman, and Veneri, 2019).

- Thus, we can employ some variables related to the urban system (i.e. size of the city) to check whether those aspects might be relevant in explaining the rural-urban gradient emerging from the baseline analysis.

Empirical framework

We benefit from the random and nationally representative selection of respondents and from a rich set of socio-economic characteristics to deal with spatial sorting.

We adopt a country fixed effect approach:

$$Y_{i,c} = \alpha + \beta_1 * DEGURBA_i + \beta_2 * X_i + \mu_c + \varepsilon_i \tag{1}$$

Where:

- $Y_{i,c}$ is the subjective life satisfaction (0-10) for individual i living in country c.
- $DEGURBA_i$ is the consistently defined type of settlement (city, town and semi-dense area, rural area) in which individual i is living.
- X_i is a vector of individual controls: 6 dummies for employment status; 10 age brackets dummies; Gender; 3 dummies for education; 6 dummies for marital status; household size, (annual income).
- μ_c represents the country fixed effects.

The observations are weighted with individual weights provided by Gallup and the standard errors are robust and clustered at the country level.

Main Results

Urban-Rural gradient in life satisfaction - Baseline model

	(1)	(2)	(3)	(4)
Rural areas	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)
Towns and suburbs	0.525***	0.172***	0.106***	0.037
	(0.068)	(0.032)	(0.030)	(0.028)
Cities	0.622***	0.359***	0.225***	0.086***
	(0.077)	(0.038)	(0.034)	(0.033)
Model	OLS	OLS	OLS	OLS
Fixed effects		✓	✓	✓
Controls			✓	✓
Obs.	160314	160314	157263	153503
R2	0.01	0.14	0.17	0.18
Rural Y mean	4.73	4.73	4.72	4.76
Rural Y sd	2.51	2.51	2.51	2.49

The individual life satisfaction (0-10) is regressed on the degree of urbanisation in which the respondent is living. Rural areas represent the baseline category, so that the coefficients for town and semi-dense areas and cities represent the difference in average life satisfaction between the residents in those areas and the rural ones. Controls include: 6 dummies for employment status; 10 age brackets dummies; Gender; 3 dummies for education; 6 dummies for marital status; household size. Column 4 also include personal income as control. The observations are weighted with individual weights provided by Gallup. The fixed effects are represented by countries. Robust standard errors are clustered at the country level and are in parentheses. *, ** and *** indicates significant at 1, 5, and 10 percent level, respectively.

Size of the effects:

- Column (1)
  T: +11.1%
  C: +13.2%

- Column (2)
  T: +3.6%
  C: +7.6%

- Column (3)
  T: +2.2%
  C: +5.4%

- Column (4)
  T: -
  C: +1.8%

Heterogeneous analysis

- World Macro-regions   ⟫ Results   ⟫ List of Countries by group

  No differences for EAP and MENA; cities ↑ in SA and SSA; both cities and towns and semi-dense areas ↑ in ECA and LAC; cities ↓ in NA.

- WB income groups   ⟫ Results   ⟫ List of Countries by group

  Cities ↑ in low income; both cities and towns and semi-dense areas ↑ in lower middle and upper middle income; no differences in high income.

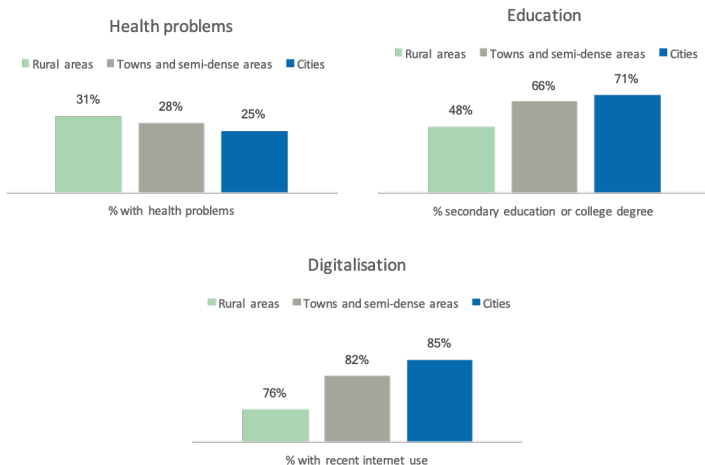- UN development levels   ⟫ Results   ⟫ List of Countries by group

  Cities ↑ in least developed; both cities and towns and semi-dense areas ↑ in less developed excl. least; no differences in more developed.

City size

- We are also able to combine the geo-coded individual observations with the relative functional urban area (FUA).

- We develop a new regression framework in which the degree of urbanisation is replaced by city size.

- We use two different categorical variables: on the one hand we take into account only the people living in functional urban areas (62,726 respondents), while on the other hand we artificially add a category to consider also the people living outside FUAs.

- The different categories are: cities with less than 250,000 inhabitants; between 250,000 and 1,000,000 inhabitants; 1-5 million; and above 5 million.

- We add country fixed effects, individual controls and the observations are weighted with individual weights. The standard errors are robust and clustered at the country level.

- **Results**: living in a FUA seems to be per se beneficial to subjective life satisfaction. Living in a city <250k or 250k-1M does not make a difference for life satisfaction. Residents in bigger cities are found to be more satisfied with their life compared to the people living in <250k cities. ⟶ Table of results

Mechanisms

- Health care?

- Education and economic opportunities?

- Access to services and infrastructure?

Health problems

% with health problems

Rural areas — 31%
Towns and semi-dense areas — 28%
Cities — 25%

Education

% secondary education or college degree

Rural areas — 48%
Towns and semi-dense areas — 66%
Cities — 71%

Digitalisation

% with recent internet use

Rural areas — 76%
Towns and semi-dense areas — 82%
Cities — 85%

Conclusions

- We find that people living in cities have consistently higher levels of life satisfaction than rural residents. Differences in life satisfaction hold after controlling for individual characteristics, although they become lower in magnitude.

- Residents in towns and semi-dense areas show levels of personal life satisfaction between those of urban and rural residents.

- Those differences are particularly high in poorer and less developed countries, vary by World macro-regions and life satisfaction is also sensitive to city size.

- **Further steps**: exploit the richness of variables in the dataset to identify the mechanisms that can explain the urban-rural gradient in life satisfaction.

Thank you!

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Sample distribution

	Rural areas	Towns & semi-dense areas	Cities	Total	
East Asia and Pacific	10,568	4,289	7,612	22,469	**13.75**
Europe and Central Asia	18,851	15,997	16,358	51,206	**31.33**
Latin America and the Caribbean	5,370	3,561	8,792	17,723	**10.84**
Middle East and North Africa	1,681	2,447	6,124	10,252	**6.27**
North America	456	489	803	1,748	**1.07**
South Asia	6,859	2,151	4,475	13,485	**8.25**
Sub-Saharan Africa	25,549	6,460	14,572	46,581	**28.50**
Low income	19,897	4,111	8,858	32,866	**20.11**
Lower middle income	25,087	12,883	22,612	60,582	**37.06**
Upper middle income	14,956	10,901	19,048	44,905	**27.47**
High income	9,394	7,499	8,218	25,111	**15.36**
Least developed	24,716	5,486	11,080	41,282	**25.25**
Less developed, excl. least developed	30,724	17,726	35,320	83,770	**51.25**
More developed	13,894	12,182	12,336	38,412	**23.50**
Total	69,334	35,394	58,736	163,464	
	42.42	**21.65**	**35.93**		

Degree of Urbanisation
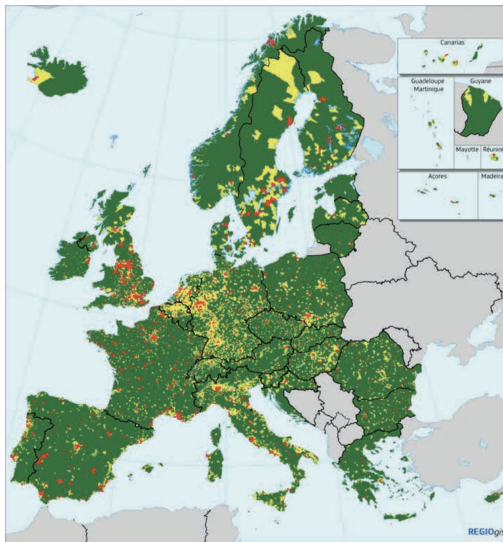
Source: Dijkstra & Poelman (2014)

Heterogeneous analysis (I) - World macroregions

	(1) Baseline	(2) EAP	(3) ECA	(4) LAC	(5) MENA	(6) NA	(7) SA	(8) SSA
Rural areas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Towns and suburbs	0.106***	-0.014	0.101**	0.186**	0.161	-0.128	0.022	0.078
	(0.030)	(0.089)	(0.049)	(0.076)	(0.130)	(0.142)	(0.098)	(0.065)
Cities	0.225***	0.181	0.141***	0.282***	0.090	-0.255*	0.137**	0.381***
	(0.034)	(0.103)	(0.050)	(0.085)	(0.223)	(0.147)	(0.035)	(0.065)
Model	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Obs.	157263	21565	49344	17331	10116	1733	13261	43912
R2	0.17	0.08	0.15	0.11	0.18	0.12	0.15	0.07
Rural Y mean	4.72	4.87	5.35	5.75	5.03	7.22	4.28	4.02
Rural Y sd	2.51	2.35	2.11	2.89	2.37	1.86	2.06	2.66

Column 1 represents the baseline results. The following columns represent the regression applied to a specific sub-sample, each one referring to a specific World macroregion: East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, North America, South Asia, Sub-Saharan Africa. The individual life satisfaction (0-10) is regressed on the degree of urbanisation in which the respondent is living. Rural areas represent the baseline category, so that the coefficients for town and semi-dense areas and cities represent the difference in average life satisfaction between the residents in those areas and the rural ones. Controls include: 6 dummies for employment status; 10 age brackets dummies; Gender; 3 dummies for education; 6 dummies for marital status; household size. The observations are weighted with individual weights provided by Gallup. The fixed effects are represented by countries, with the exception of Column 6 in which they are represented by US Federal States. Robust standard errors are clustered at the country level - with the exception of Column 6 in which they are clustered at the US Federal State level - and are in parentheses. *, ** and *** indicates significant at 1, 5, and 10 percent level, respectively.

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Heterogeneous analysis (II) - WB income groups

	(1) Baseline	(2) LowIncome	(3) LowerMiddle	(4) UpperMiddle	(5) HighIncome
Rural areas	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
Towns and suburbs	0.106***	0.005	0.095**	0.167**	0.033
	(0.030)	(0.087)	(0.044)	(0.061)	(0.065)
Cities	0.225***	0.352***	0.174***	0.278***	-0.017
	(0.034)	(0.072)	(0.059)	(0.062)	(0.077)
Model	OLS	OLS	OLS	OLS	OLS
Fixed effects	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Obs.	157263	31652	57194	43836	24581
R2	0.17	0.07	0.11	0.14	0.17
Rural Y mean	4.72	3.92	4.74	5.14	5.67
Rural Y sd	2.51	2.56	2.47	2.41	2.17

Column 1 represents the baseline results. The following columns represent the regression applied to a specific sub-sample of countries classified by the World Bank income classification. The individual life satisfaction (0-10) is regressed on the degree of urbanisation in which the respondent is living. Rural areas represent the baseline category, so that the coefficients for town and semi-dense areas and cities represent the difference in average life satisfaction between the residents in those areas and the rural ones. Controls include: 6 dummies for employment status; 10 age brackets dummies; Gender; 3 dummies for education; 6 dummies for marital status; household size. The observations are weighted with individual weights provided by Gallup. The fixed effects are represented by countries. Robust standard errors are clustered at the country level and are in parentheses. *, ** and *** indicates significant at 1, 5, and 10 percent level, respectively.

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Heterogeneous analysis (III) - UN development levels

	(1) Baseline	(2) LeastDeveloped	(3) LessDeveloped	(4) MoreDeveloped
Rural areas	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)
Towns and suburbs	0.106***	-0.050	0.146***	0.082
	(0.030)	(0.072)	(0.036)	(0.063)
Cities	0.225***	0.273***	0.251***	0.081
	(0.034)	(0.071)	(0.047)	(0.060)
Model	OLS	OLS	OLS	OLS
Fixed effects	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Obs.	157263	38733	81817	36713
R2	0.17	0.06	0.14	0.17
Rural Y mean	4.72	4.01	4.92	5.52
Rural Y sd	2.51	2.56	2.48	2.18

Column 1 represents the baseline results. The following columns represent the regression applied to a specific sub-sample of countries classified by the United Nations development level classification. The individual life satisfaction (0-10) is regressed on the degree of urbanisation in which the respondent is living. Rural areas represent the baseline category, so that the coefficients for town and semi-dense areas and cities represent the difference in average life satisfaction between the residents in those areas and the rural ones. Controls include: 6 dummies for employment status; 10 age brackets dummies; Gender; 3 dummies for education; 6 dummies for marital status; household size. The observations are weighted with individual weights provided by Gallup. The fixed effects are represented by countries. Robust standard errors are clustered at the country level and are in parentheses. *, ** and *** indicates significant at 1, 5, and 10 percent level, respectively.

List of countries by world macro-region

- **East Asia and Pacific**: Cambodia, China, Indonesia, Laos, Mongolia, Myanmar, Philippines, Singapore, Thailand, Vietnam.

- **Europe and Central Asia**: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Greece, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan.

- **Latin America and the Caribbean**: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela.

- **Middle East and North Africa**: Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, Tunisia.

- **North America**: United States.

- **South Asia**: Afghanistan, Bangladesh, India, Nepal, Pakistan, Sri Lanka.

- **Sub-Saharan Africa**: Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Chad, Congo Brazzaville, Congo Kinshasa, Ethiopia, Gabon, Gambia, Ghana, Guinea, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, South Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

List of countries by income group

- **Low income**: Afghanistan, Benin, Burkina Faso, Central African Republic, Chad, Congo Kinshasa, Ethiopia, Gambia, Guinea, Haiti, Liberia, Madagascar, Malawi, Mali, Mozambique, Nepal, Niger, Rwanda, Senegal, Sierra Leone, South Sudan, Tanzania, Togo, Uganda, Zimbabwe.

- **Lower middle income**: Armenia, Bangladesh, Bolivia, Cambodia, Cameroon, Congo Brazzaville, Egypt, El Salvador, Georgia, Ghana, Guatemala, Honduras, India, Indonesia, Ivory Coast, Jordan, Kenya, Kyrgyzstan, Laos, Lesotho, Mauritania, Moldova, Mongolia, Morocco, Myanmar, Nicaragua, Nigeria, Pakistan, Palestine, Philippines, Sri Lanka, Tajikistan, Tunisia, Ukraine, Uzbekistan, Vietnam, Zambia.

- **Upper middle income**: Albania, Algeria, Argentina, Azerbaijan, Belarus, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, China, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, Gabon, Jamaica, Kazakhstan, Kosovo, Lebanon, Macedonia, Mexico, Montenegro, Namibia, Panama, Paraguay, Peru, Romania, Russia, Serbia, South Africa, Thailand, Turkey, Turkmenistan, Venezuela.

- **High income**: Chile, Czech Republic, Estonia, Greece, Hungary, Israel, Latvia, Lithuania, Poland, Singapore, Slovakia, Trinidad and Tobago, Uruguay, United States

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List of countries by development level

- **Least developed**: Afghanistan, Bangladesh, Benin, Burkina Faso, Cambodia, Central African Republic, Chad, Congo Kinshasa, Ethiopia, Gambia, Guinea, Haiti, Laos, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Senegal, Sierra Leone, South Sudan, Tanzania, Togo, Uganda.

- **Less developed, ex. least developed**: Algeria, Argentina, Armenia, Azerbaijan, Bolivia, Botswana, Brazil, Cameroon, Chile, China, Colombia, Congo Brazzaville, Costa Rica, Dominican Republic, Ecuador, Egypt, El Salvador, Gabon, Georgia, Ghana, Guatemala, Honduras, India, Indonesia, Israel, Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Lebanon, Mexico, Mongolia, Morocco, Namibia, Nicaragua, Nigeria, Pakistan, Palestine, Panama, Paraguay, Peru, Philippines, Singapore, South Africa, Sri Lanka, Tajikistan, Thailand, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uruguay, Uzbekistan, Venezuela, Vietnam, Zambia, Zimbabwe.

- **More developed**: Albania, Belarus, Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Ukraine, United States.

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Effect of city size

	(1)	(2)
<250k	0.000	0.140***
	(.)	(0.036)
250k-1M	0.048	0.177***
	(0.045)	(0.037)
1M-5M	0.203***	0.317***
	(0.064)	(0.053)
>5M	0.205**	0.285***
	(0.093)	(0.095)
Outside FUA		0.000
		(.)
Model	OLS	OLS
Fixed effects	✓	✓
Controls	✓	✓
Obs.	60780	153572
R2	0.15	0.17
Rural Y mean	5.09	4.84
Rural Y sd	2.40	2.47

The individual life satisfaction (0-10) is regressed on the size of the city of residence. Column 1 includes only respondents living in FUAs (baseline category is cities with <250k inhabitants). Column 2 includes also people living outside FUAs as reference category. Controls include: 6 dummies for employment status; 10 age brackets dummies; Gender; 3 dummies for education; 6 dummies for marital status; household size. The observations are weighted with individual weights provided by Gallup. The fixed effects are represented by countries. Robust standard errors are clustered at the country level and are in parentheses. *, ** and *** indicates significant at 1, 5, and 10 percent level, respectively.