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# Health Outcomes of Social Exclusion: An Empirical Analysis

## PRESENTED BY

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# Introduction

## *Health*

o Health is the main ingredient of human capital and well-being.

o It is a key input that underlines personal, social and physical resources.

o Health status has been improved, but it varies across nations.

o Thus question arises why some individuals, societies and states are healthier than others?

o  "Wealthier is healthier"

o But there are some low countries that have good health status.

o Thus, there is still need to find what factors determine health status.

## *Social Exclusion*

o Social exclusion is considered as one of most important determinant of health.

o Social exclusion is rupture of social solidarity and social justice.

o Walker and Walker (1997), social exclusion is "The dynamic process of being shut out from any of the social, economic, political and cultural systems which determine the social integration of a person in society".

o Lack of participation and feelings of low empowerment has adverse impact on well-being and health which in turn, leads to further deprivation such as low education, low income and joblessness.

# Literature review

Determinants of health

Health and social exclusion
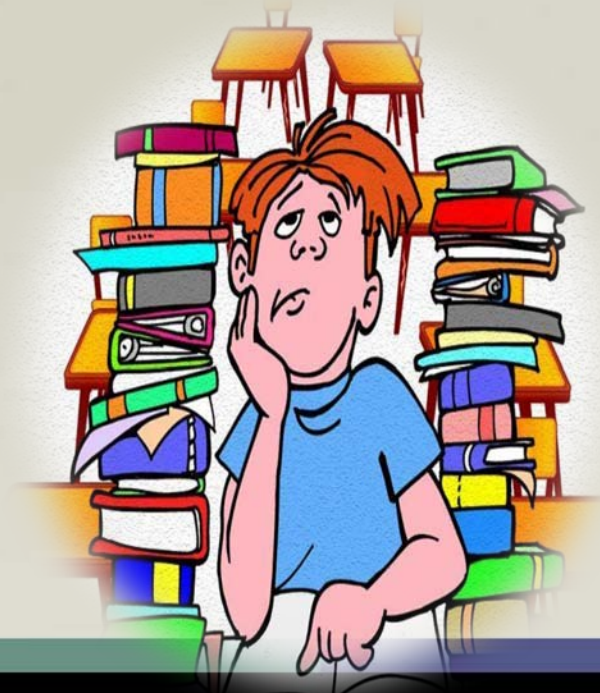
# Literature review (Health Determinants)

Major determinants of heath are:

o Income (Pritchett & Summers,1996; Kabir,2008)

o Health care facilities (Mohan & Mirmirani, 2007; Gilligan & Skrepnek 2014)

o Education (Messias 2003; Feinstein *et al.,* 2006, Ross & wu, 1995)

o Environmental factors (Fayissa & Gutema, 2005; Bayati *et al.,* 2013)

o Water, sanitation, urbanization (Kamiya 2010; Bayati *et al.,* 2013) & so on.

# Literature review (Health & social exclusion)

**Impact of social exclusion/inclusion\* on health:**

o Social exclusion or isolation leads to adverse health outcomes while increased social Inclusion leads to improved health status (Sen, 1999; Payne, 2000; McCulloh, 2001; Osmani & Sen 2003; Wilkinson & Marmot, 2003; Sagric et al., 2007; Boardman, 2011).

o In contrast few studies find that social exclusion/inclusion have no impact on health (Kennelly et *al.,* 2003)

| Sen (1999) | Wilkinson & Marmot (2003) | Kennelly *et al*. (2003) | Cohen (2004) | Sorlin et al. (2012) & Erdogan *et al* (2012) |
|---|---|---|---|---|
| Community relations & social arrangements explain differences in longevity, well being & living standard. | SE leads to ill-healtj exclude from social support and networks that resources in time of hardship | Trust, participation in voluntary organizations and unpaid work for these organizations have no statistically significant impact on health. | social support, networks & r/s with family provide necessary resources, generate sense of being valued, loved, esteemed, leading to better health. | Gender inequality ( in employment and education ) has adverse effect on health status. |

\* Terms exclusion and inclusion are used interchangeably

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# Problem statement

- Exclusion have **adverse influence** on mental and physical health.

- Limited in **scope** and **approach** used.

- Modest attention has been paid in finding **empirical relationship** between these concepts.

- This study tries to investigate the linkage between health and social using **objective** measures of variable of interest.

# Research Questions

## To be answered by this Study

1. Does social exclusion lead to poor health?

2. Do different measures of social exclusion impact health equally?

3. Are the relationships between health and social exclusion robust to inclusion of other determinants of health?

# Contribution of the study

o First, This study extends the existing literature on health and social exclusion using a sufficiently larger cross Sectional as well as panel data sets.

o Second, this study addresses the problem of potential endogeneity in our model using appropriate instruments

o Third, various proxies of variables of interest are used.

o Last but not least, we extended our investigation to check whether results are robust to other determinants of health.

# Hypothesis

$H_{01}$ = There is no relationship between health outcomes and social exclusion

$H_{A1}$ = The impact of social exclusion on health outcomes is negative

# Model Specification

o **Grossman (1972)** developed a theoretical health production function, which can be specified as

$$H= f(Inputs\ to\ health)....A$$

o To convert this micro level model in macro level, inputs to health are represented in per capita form and are reorganized in three categories; economic (Y), social (S) and environmental (V) factors

$$H= f(Y,\ S,V)....B$$

o The variables in economic factors vector includes economic growth & health facilities, variable in social factors vector is restricted to education; and variable in environmental factors vector include carbon dioxide emissions.

$$H= f(Economic\ Growth,\ Health\ Fac.\ Edu.\ CO_2\ Emis)....i$$

# Model Specification (Cont…)

○ This study intends to discover the other potential factors that may influence health  by focusing on social exclusion.

   H= f(Economic Growth, Health Fac, Edu, CO2 Emis, Social exclusion)    **(ii)**

○ Above relationships between "health and social exclusion" can be written in the form of panel equations as follow

$lnH_{it} = α_{it} + α_2 lnY_{it} + α_3 lnPHY_{it} + α_4 lnEDU_{it} + α_5 lnCO2E_{it} + α_6 lnSE_{it} + ε_{it}$   **(iii)**

# Econometric Techniques and Data

## Econometric Techniques

o Cross country OLS and Two Stage Least Square (2SLS)

o Pooled OLS

o Fixed effects

o System GMM

## Data

o Interval: 5 year interval

o Countries and time Period: 104 –179 countries spanning over 1990–2010.

Empirical Results

# CS OLS Results (Health and Social Exclusion)

| Variables | (1) | (2) | (3) | (4) | Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|---|---|---|---|---|
| | **Life Expectancy** | | | | | **Infant Mortality** | | | |
| Economic Growth | 0.0293*** | 0.0392*** | 0.0301*** | 0.0328*** | Economic Growth | -0.560*** | -0.564*** | -0.502*** | -0.511*** |
| | (0.00654) | (0.00864) | (0.00557) | (0.00653) | | (0.0442) | (0.0488) | (0.0381) | (0.0421) |
| $CO_2$ Emission | -0.0102 | -0.0282** | -0.0217** | -0.0175* | $CO_2$ Emission | 0.202*** | 0.0771 | 0.189*** | 0.122** |
| | (0.00963) | (0.0140) | (0.00868) | (0.00905) | | (0.0562) | (0.0696) | (0.0497) | (0.0530) |
| Education | 0.0806*** | 0.0653 | 0.0840*** | 0.0954*** | Education Female | -0.486*** | -0.277** | -0.459*** | -0.298*** |
| | (0.0301) | (0.0405) | (0.0249) | (0.0236) | | (0.118) | (0.110) | (0.106) | (0.108) |
| Physicians | 0.0464*** | 0.0580*** | 0.0403*** | 0.0442*** | Immunization | -0.677** | -0.595 | -0.617** | -0.446* |
| | (0.0101) | (0.0148) | (0.00850) | (0.00847) | | (0.262) | (0.386) | (0.278) | (0.239) |
| Intergroup Cohesion | -0.0242 | | | | Intergroup Cohesion | 0.0560 | | | |
| | (0.0479) | | | | | (0.285) | | | |
| Clubs & Association | | 0.00835 | | | Clubs & Association | | 0.0930 | | |
| | | (0.0373) | | | | | (0.176) | | |
| Safety & Trust | | | 0.126*** | | Safety & Trust | | | -0.861*** | |
| | | | (0.0345) | | | | | (0.188) | |
| Gender Equality | | | | -0.0118 | Gender Equality | | | | -1.212*** |
| | | | | (0.0497) | | | | | (0.310) |
| Constant | 3.642*** | 3.660*** | 3.741*** | 3.569*** | Constant | 12.49*** | 11.40*** | 11.00*** | 9.924*** |
| | (0.138) | (0.207) | (0.117) | (0.117) | | (1.275) | (1.640) | (1.181) | (1.163) |
| Obs | 153 | 106 | 149 | 179 | Obs | 151 | 104 | 145 | 174 |
| R-Squared | 0.808 | 0.817 | 0.822 | 0.803 | R-Squared | 0.860 | 0.886 | 0.871 | 0.863 |

# CS 2SLS Results (Health and Social Exclusion)

| Variables | (1) | (2) | (3) | (4) | Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|---|---|---|---|---|
| | **Life Expectancy** | | | | | **Infant Mortality** | | | |
| Economic Growth | 0.0282*** | 0.0365*** | 0.0277*** | 0.0319*** | Economic Growth | -0.565*** | -0.571*** | -0.505*** | -0.511*** |
| | (0.00784) | (0.00838) | (0.00648) | (0.00701) | | (0.0474) | (0.0465) | (0.0391) | (0.0398) |
| CO2 Emission | -0.0102 | -0.0281** | -0.0193** | -0.0169** | CO2 Emission | 0.206*** | 0.0902 | 0.184*** | 0.135*** |
| | (0.00895) | (0.0123) | (0.00820) | (0.00854) | | (0.0503) | (0.0658) | (0.0462) | (0.0451) |
| Education | 0.0796*** | 0.0636** | 0.0856*** | 0.0924*** | Education Female | -0.484*** | -0.286** | -0.476*** | -0.341*** |
| | (0.0230) | (0.0316) | (0.0212) | (0.0209) | | (0.108) | (0.144) | (0.106) | (0.0988) |
| Physicians | 0.0470*** | 0.0610*** | 0.0382*** | 0.0458*** | Immunization | -0.713** | -0.560* | -0.661** | -0.407* |
| | (0.00869) | (0.0106) | (0.00770) | (0.00796) | | (0.283) | (0.305) | (0.273) | (0.235) |
| Intergroup Cohesion | -0.00608 | | | | Intergroup Cohesion | 0.206 | | | |
| | (0.0660) | | | | | (0.411) | | | |
| Clubs & Association | | 0.0232 | | | Clubs & Association | | 0.200 | | |
| | | (0.0399) | | | | | (0.207) | | |
| Safety &Trust | | | 0.130*** | | Safety & Trust | | | -0.610*** | |
| | | | (0.0353) | | | | | (0.212) | |
| Gender Equality | | | | -0.0220 | Gender Equality | | | | -1.093*** |
| | | | | (0.0690) | | | | | (0.412) |
| Constant | 3.664*** | 3.698*** | 3.754*** | 3.584*** | Constant | 12.77*** | 11.41*** | 11.48*** | 9.972*** |
| | (0.127) | (0.154) | (0.105) | (0.114) | | (1.346) | (1.289) | (1.163) | (1.141) |
| Observation | 152 | 104 | 145 | 174 | Observations | 150 | 103 | 143 | 172 |
| R-Squared | 0.807 | 0.818 | 0.816 | 0.802 | R-Squared | 0.860 | 0.887 | 0.869 | 0.865 |
| Sargan & Basmann | (p = 0.1601) (p = 0.1689) | (p = 0.1687) (p = 0.1825) | (p = 0.3113) (p = 0.3261) | (p = 0.0264) (p = 0.0269) | Sargan & Basmann | (p = 0.0039) (p = 0.0035) | (p = 0.1110) (p = 0.1203) | (p = 0.0091) (p = 0.0086) | (p = 0.356) (p = 0.369) |
| Durbin Hausman | (p = 0.7003) (p = 0.7073) | (p = 0.6207) (p = 0.6333) | (p = 0.6601) (p = 0.6684) | (p = 0.0264) (p = 0.0269) | WDurbin Hausman | (p = 0.5805) (p = 0.5900) | (p = 0.3879) (p = 0.4049) | (p = 0.0526) (p = 0.0575) | (p = 0.582) (p = 0.591) |

# Pooled OLS Results (Health and Social Exclusion)

| Variables | (1) | (2) | (3) | (4) | Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|---|---|---|---|---|
| | Life Expectancy | | | | | Infant Mortality | | | |
| Economic Growth | 0.0280*** | 0.0427*** | 0.0374*** | 0.0325*** | Economic Growth | -0.559*** | -0.568*** | -0.528*** | -0.527*** |
| | (0.00383) | (0.00404) | (0.00331) | (0.00307) | | (0.0257) | (0.0245) | (0.0222) | (0.0197) |
| CO2 Emission | -0.00653 | -0.0332*** | -0.0294*** | -0.0102** | CO2 Emission | 0.132*** | 0.0919*** | 0.154*** | 0.120*** |
| | (0.00573) | (0.00727) | (0.00573) | (0.00463) | | (0.0311) | (0.0354) | (0.0320) | (0.0232) |
| Education | 0.0790*** | 0.0882*** | 0.0927*** | 0.0915*** | Education Female | -0.325*** | -0.343*** | -0.430*** | -0.276*** |
| | (0.0112) | (0.0151) | (0.0112) | (0.00913) | | (0.0572) | (0.0692) | (0.0629) | (0.0369) |
| Physicians | 0.0360*** | 0.0435*** | 0.0334*** | 0.0316*** | Immunization | -0.585*** | -0.839*** | -0.819*** | -0.462*** |
| | (0.00509) | (0.00831) | (0.00567) | (0.00419) | | (0.124) | (0.150) | (0.167) | (0.0926) |
| Intergroup Cohesion | 0.0478** | | | | Intergroup Cohesion | -0.423*** | | | |
| | (0.0243) | | | | | (0.121) | | | |
| Clubs & Association | | -0.00298 | | | Clubs and Association | | 0.109 | | |
| | | (0.0187) | | | | | (0.102) | | |
| Safety & Trust | | | 0.0747*** | | Safety & Trust | | | -0.565*** | |
| | | | (0.0225) | | | | | (0.103) | |
| | | | | 0.0251 | | | | | -1.046*** |
| Gender Equality | | | | (0.0251) | Gender Equality | | | | (0.129) |
| Constant | 3.707*** | 3.537*** | 3.619*** | 3.599*** | Constant | 11.12*** | 12.72*** | 12.13*** | 9.998*** |
| | (0.0622) | (0.0743) | (0.0574) | (0.0499) | | (0.598) | (0.647) | (0.742) | (0.463) |
| | 469 | 399 | 445 | 684 | | 487 | 416 | 467 | 713 |
| Obs | 0.780 | 0.739 | 0.729 | 0.773 | Obs | 0.849 | 0.855 | 0.833 | 0.861 |
| R-Squared | 0.0280*** | 0.0427*** | 0.0374*** | 0.0325*** | R-Squared | -0.559*** | -0.568*** | -0.528*** | -0.527*** |

# Fixed Effect Results (Health and Social Exclusion)

| Variables | (1) | (2) | (3) | (4) | Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|---|---|---|---|---|
| | Life Expectancy | | | | | Infant Mortality | | | |
| Economic Growth | 0.0835*** | 0.0737*** | 0.0723*** | 0.0774*** | Economic Growth | -0.950*** | -1.070*** | -1.020*** | -0.906*** |
| | (0.0141) | (0.0114) | (0.0114) | (0.0131) | | (0.0862) | (0.100) | (0.101) | (0.0708) |
| CO2 Emission | -0.0270 | -0.00883 | -0.0256* | -0.0301** | CO2 Emission | 0.199*** | 0.397*** | 0.328*** | 0.283*** |
| | (0.0165) | (0.0131) | (0.0136) | (0.0150) | | (0.0722) | (0.0957) | (0.104) | (0.0699) |
| Education | 0.111*** | 0.0971*** | 0.0968*** | 0.112*** | Education Female | -0.272*** | -0.274*** | -0.215*** | -0.264*** |
| | (0.0142) | (0.0146) | (0.0165) | (0.0110) | | (0.0477) | (0.0586) | (0.0572) | (0.0386) |
| Physicians | -0.00261 | 0.0123 | 0.00678 | -0.000804 | Immunization | -0.313*** | -0.562*** | -0.491*** | -0.296*** |
| | (0.00917) | (0.0108) | (0.00793) | (0.00639) | | (0.0775) | (0.135) | (0.157) | (0.0779) |
| Intergroup Cohesion | 0.0347** | | | | Intergroup Cohesion | -0.164*** | | | |
| | (0.0143) | | | | | (0.0588) | | | |
| Clubs & Association | | 0.0260* | | | Clubs & Association | | -0.191** | | |
| | | (0.0132) | | | | | (0.0924) | | |
| Safety & Trust | | | -0.0262 | | Safety & Trust | | | 0.142* | |
| | | | (0.0195) | | | | | (0.0837) | |
| Gender Equality | | | | 0.0489*** | Gender Equality | | | | -0.371*** |
| | | | | (0.0154) | | | | | (0.0822) |
| Constant | 3.123*** | 3.234*** | 3.234*** | 3.164*** | Constant | 12.96*** | 14.94*** | 14.25*** | 12.42*** |
| | (0.110) | (0.0911) | (0.0911) | (0.115) | | (0.711) | (0.938) | (1.041) | (0.579) |
| Observation | 469 | 399 | 445 | 684 | Observations | 487 | 416 | 467 | 713 |
| R-Squared | 0.638 | 0.560 | 0.600 | 0.483 | R-Squared | 0.733 | 0.771 | 0.749 | 0.704 |
| Countries | 143 | 101 | 139 | 176 | Countries | 147 | 102 | 142 | 174 |

# System GMM Results (Health and Social Exclusion)

| Variables | Life Expectancy | | | | Variables | Infant Mortality | | | |
|---|---|---|---|---|---|---|---|---|---|
| Lag Life Expectancy | 0.834*** | 0.823*** | 0.949*** | 0.901*** | Lag Infant Mortality | 0.00196 | 0.0201*** | 0.00119 | 0.000978 |
| | (0.0328) | (0.0521) | (0.0312) | (0.0385) | | (0.00169) | (0.00331) | (0.00337) | (0.00371) |
| Economic Growth | 0.00305*** | 0.00201* | 0.00258** | 0.00293* | Economic Growth | -0.434*** | -1.119*** | -0.899*** | -1.170*** |
| | (0.00109) | (0.00122) | (0.00132) | (0.00166) | | (0.0720) | (0.0915) | (0.131) | (0.192) |
| CO2 Emission | -0.0227*** | -0.0317*** | -0.0238** | -0.0342*** | CO2 Emission | 0.186** | 0.651*** | 0.457*** | 0.610*** |
| | (0.00869) | (0.00982) | (0.00940) | (0.00854) | | (0.0725) | (0.0789) | (0.0972) | (0.111) |
| Education | 0.0388*** | 0.0478** | 0.0380* | 0.0436*** | Education Female | -0.0164*** | -0.00409* | -0.0169*** | -0.016*** |
| | (0.0114) | (0.0224) | (0.0218) | (0.0114) | | (0.00259) | (0.00246) | (0.00420) | (0.00498) |
| Physicians | 0.0140* | 0.0235** | 0.00416 | 0.0170* | Immunization | -0.395*** | -0.163 | -0.675** | 0.181 |
| | (0.00748) | (0.0104) | (0.00735) | (0.00907) | | (0.115) | (0.257) | (0.342) | (0.275) |
| Intergroup Cohesion | 0.0193** | | | | Intergroup Cohesion | -0.123** | | | |
| | (0.00917) | | | | | (0.0488) | | | |
| Clubs & Association | | 0.0367* | | | Clubs & Association | | -0.107* | | |
| | | (0.0189) | | | | | (0.0553) | | |
| Safety & Trust | | | 0.0279*** | | Safety & Trust | | | -0.248*** | |
| | | | (0.00887) | | | | | (0.0935) | |
| Gender Equality | | | | 0.0247** | Gender Equality | | | | -0.220* |
| | | | | (0.0125) | | | | | (0.123) |
| Constant | 0.584*** | 0.617*** | 0.111 | 0.288* | Constant | 9.162*** | 12.92*** | 14.87*** | 13.47*** |
| | (0.107) | (0.188) | (0.109) | (0.158) | | (0.689) | (1.468) | (1.671) | (2.140) |
| Observations | 286 | 274 | 252 | 441 | Observations | 300 | 256 | 326 | 450 |
| Countries | 105 | 82 | 103 | 138 | Countries | 108 | 80 | 109 | 133 |
| Instruments | 34 | 33 | 33 | 33 | Instruments | 34 | 31 | 29 | 29 |
| AR1 (Pr > z) | 0.981 | 0.572 | 0.273 | 0.564 | AR1 (Pr > z) | 0.031 | 0.002 | 0.012 | 0.009 |
| AR2 (Pr > z) | 0.230 | 0.198 | 0.418 | 0.116 | AR2 (Pr > z) | 0.198 | 0.720 | 0.600 | 0.679 |

# Summary of sensitivity analysis (Health and Social Exclusion)

| Life expectancy as health measures | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variables** | **Original** | **Water** | **Health expenditure** | **Age dependency** | **Employment** | **Undernourishment** | **Urbanization** |
| **Intergroup Cohesion** | 0.0193** | 0.0128 | 0.00945 | 0.0222** | 0.0128 | 0.0214 | 0.0191 |
| | (0.00917) | (0.00969) | (0.0102) | (0.00886) | (0.00892) | (0.0177) | (0.0132) |
| **Clubs and Association** | 0.0367* | 0.0391** | 0.0273* | 0.059*** | 0.0250 | 0.0119 | 0.0430** |
| | (0.0189) | (0.0186) | (0.0149) | (0.0229) | (0.0193) | (0.0145) | (0.0199) |
| **Safety and Trust** | 0.027*** | 0.027*** | 0.0305*** | 0.026*** | 0.026*** | 0.0174 | 0.029*** |
| | (0.00887) | (0.00951) | (0.00872) | (0.00973) | (0.00855) | (0.0106) | (0.0111) |
| **Gender Equality** | 0.0274** | 0.0260* | 0.0149 | 0.0235* | 0.0214** | 0.0361** | 0.0333** |
| | (0.0122) | (0.0154) | (0.0155) | (0.0138) | (0.0108) | (0.0177) | (0.0143) |
| Infant mortality as health measures | | | | | | | |
| **Intergroup Cohesion** | -0.123** | -0.118** | -0.137*** | -0.0569 | -0.0876* | -0.0408 | -0.0845 |
| | (0.0488) | (0.0515) | (0.0474) | (0.0597) | (0.0496) | (0.0579) | (0.0568) |
| **Clubs and Association** | -0.107* | -0.0344 | -0.131** | 0.0193 | 0.117 | 0.200*** | -0.291*** |
| | (0.0553) | (0.0652) | (0.0574) | (0.0567) | (0.122) | (0.0514) | (0.0907) |
| **Safety and Trust** | -0.24*** | -0.26*** | -0.323*** | -0.180 | -0.32*** | -0.115* | -0.220** |
| | (0.0935) | (0.0864) | (0.0934) | (0.121) | (0.111) | (0.0624) | (0.1000) |
| **Gender Equality** | -0.220* | -0.178 | -0.168 | -0.178 | -0.0583 | 0.0163 | -0.230* |
| | (0.123) | (0.113) | (0.138) | (0.124) | (0.109) | (0.0880) | (0.137) |

# Conclusion

o   This study confirms that decreased social exclusion – in terms of lower gender inequality, greater social cohesion and higher trust– improves population health

o   In both cross sectional and panel techniques, we find that the impact of trust and gender equality on health is stronger than intergroup cohesion and association.

o   Some proxies of social exclusion are sensitive to inclusion of other determinants of health.

o   In addition, economic growth, education and health facilities have favorable effect on health, while $CO_2$ emission has adverse impact on health.

"So the point is...."

# Limitation

o Life expectancy may increase in a country but there may be little gain in overall health and mortality reduction, as it doesn't consider quality of life but consider only quantity of life. Thus there is need to construct a single, comprehensive measure of health.

o Besides, in order to empirically investigate the influence of social exclusion on health, ISD data is used, which is available at five year interval during 1990-2010. So, further research can be conducted using large and up-to date dataset.

# Implication

o Programs to improve population health must not focus only on policies which foster economic development but also on policies which tend to reduce social exclusion.

o Non-income factors such as reduced $CO_2$ emissions and increased literacy may help in improving health outcomes.

o Government could make policies that promote inclusion and discourage exclusion, by promoting gender equality and participation in political, cultural and social activities.

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THANK YOU