



**Mexican Health &
Aging Study**



**Estudio Nacional de
Salud y Envejecimiento
en México**

Mexican Health and Aging Study (MHAS)

www.MHASweb.org

www.ENASEM.org

Population Aging in Mexico

- ‘Premature’: with low social and economic development
- Current elderly survived high levels of infectious diseases
- Chronic diseases are a growing problem yet infectious diseases are still prominent
- Unique: aging in Mexico closely tied to U.S.

Prospective National Longitudinal Study of Aging in Mexico

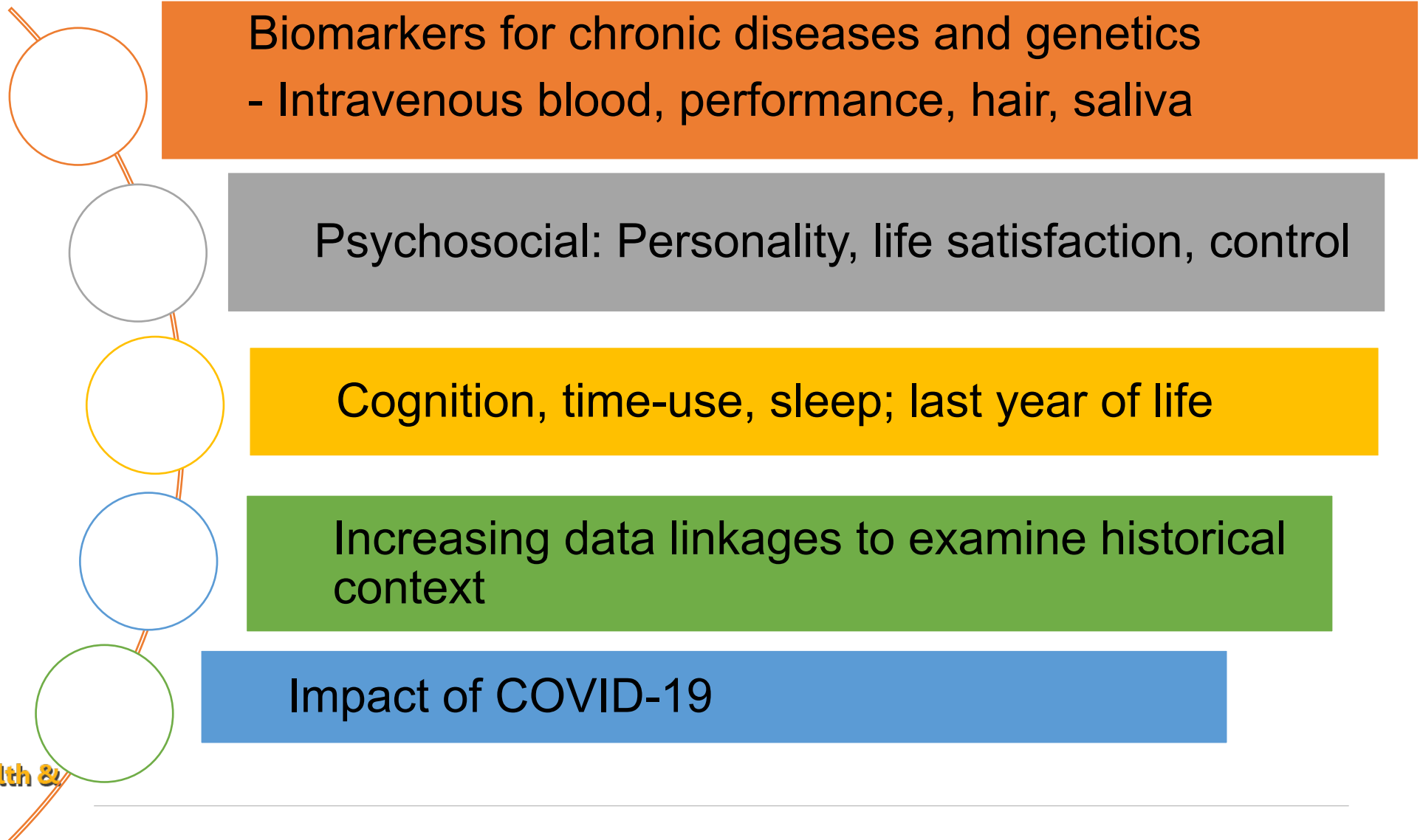
- Follow adults aged 50+ until death
- Exit interview upon death
- Couples are followed
- Over-sample of former migrants to the US
- Comparable to U.S. Health and Retirement Study

Multiple Themes to Study Aging

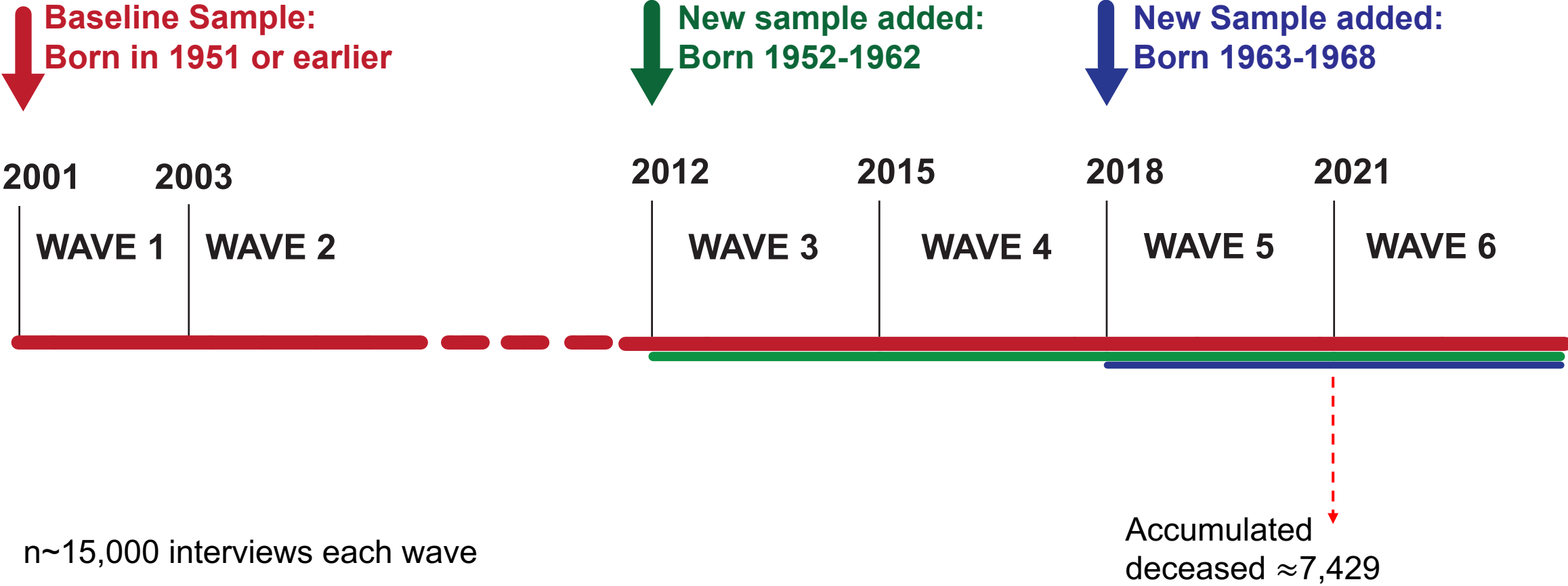
MHAS Covers:

- | | |
|--|---|
| • Sociodemographic characteristics | • Economic data; health insurance, pensions |
| • Health – multiple dimensions
• Cognitive assessment
• ADL and IADL limitations | • Work history and current employment |
| • Family and social networks | • Dwelling characteristics |
| • Childhood SES and health; migration experiences | • Attitudes about health, economic status |
| • Help given/received | • Widowhood and last year of life |
| • Psychosocial: Personality, loneliness, locus of control, life satisfaction | • Time use; sleep, smoking, drinking |
| • Environmental exposures | • Biomarkers (blood, saliva, hair), performance, anthropometrics |

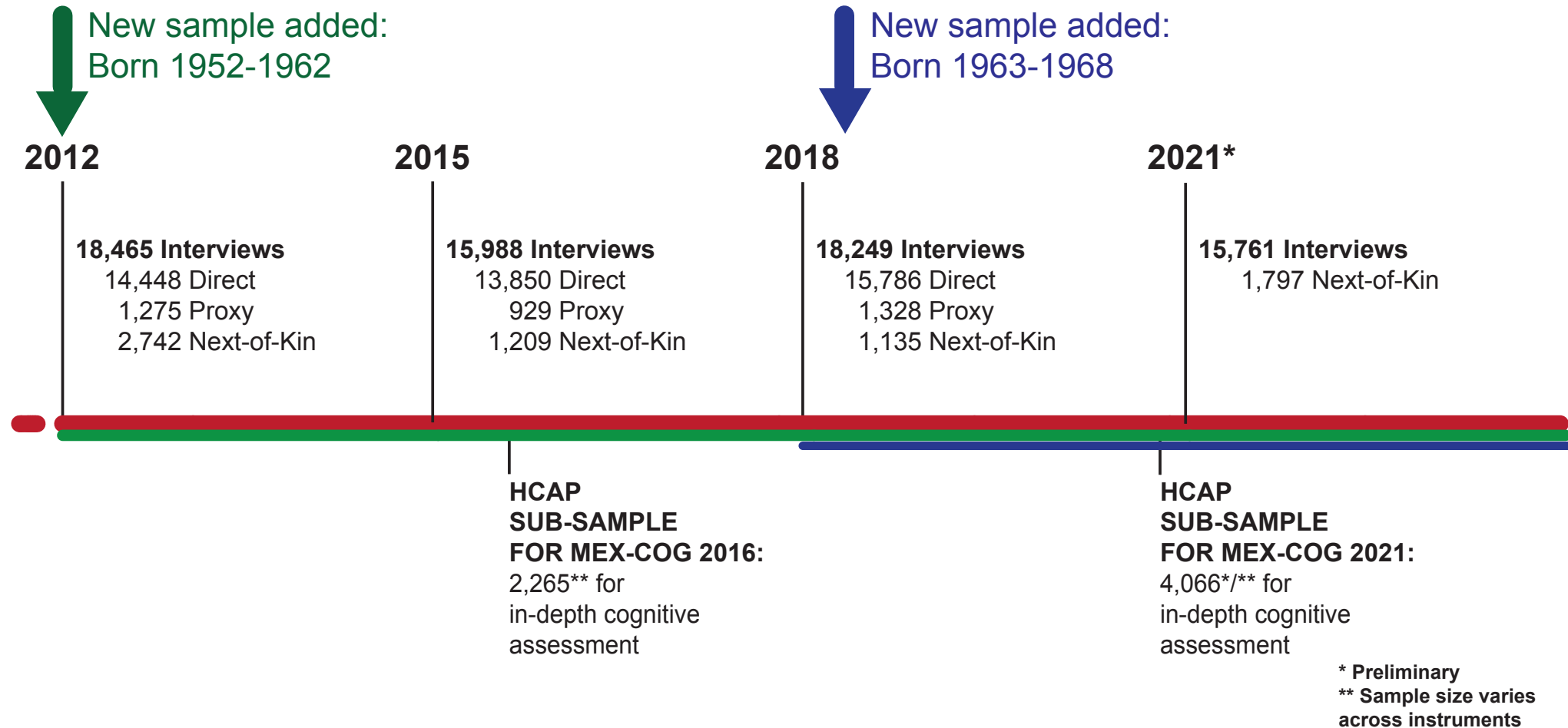
Study Evolved as the Field Evolved



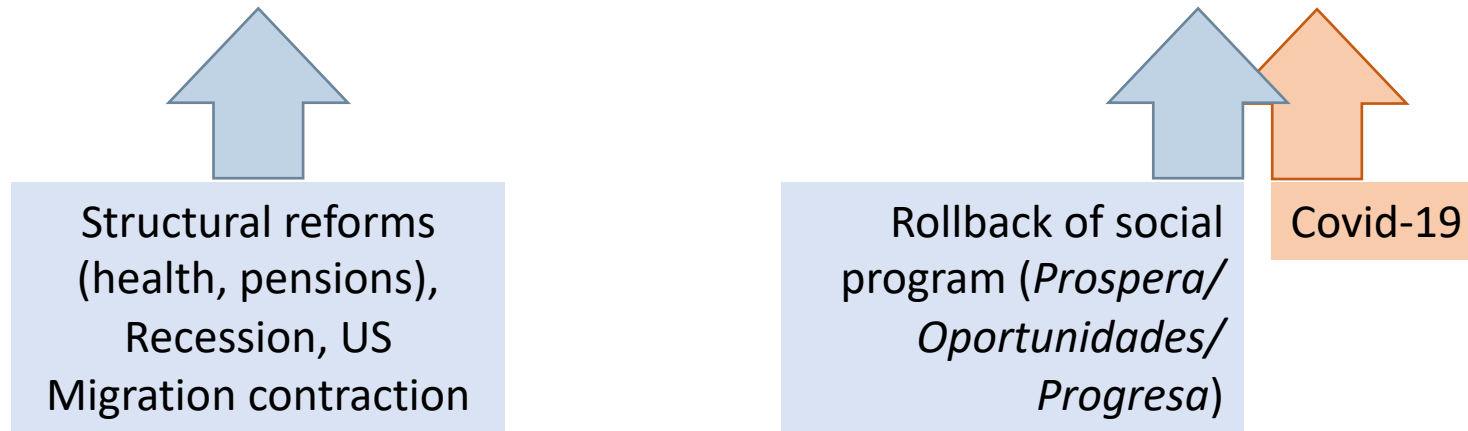
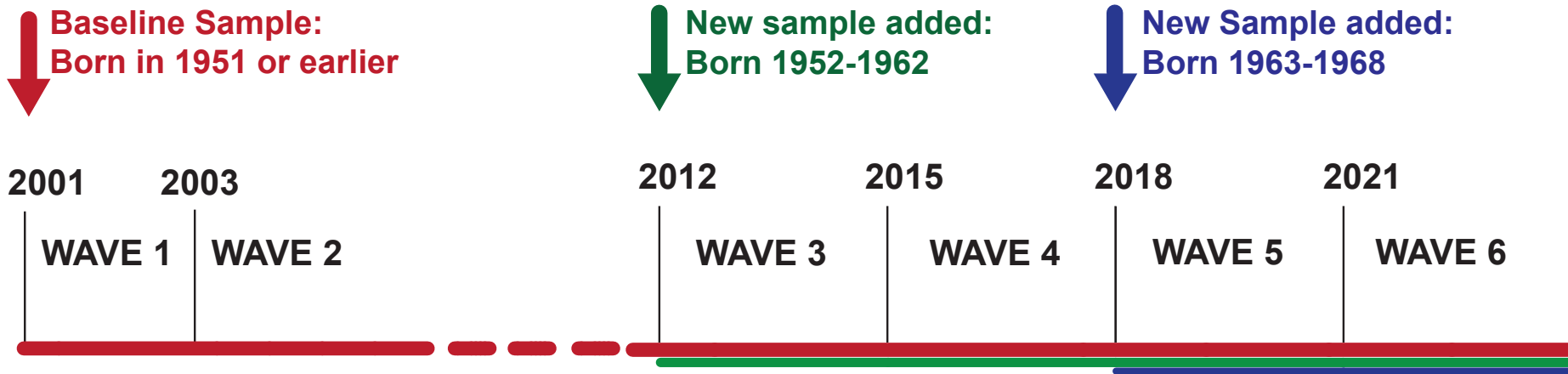
Timeline of Longitudinal Waves



MHAS Ancillary Study on Cognitive Aging (Mex-Cog)



Structural Shocks through the MHAS Panel



Valuable about the Data

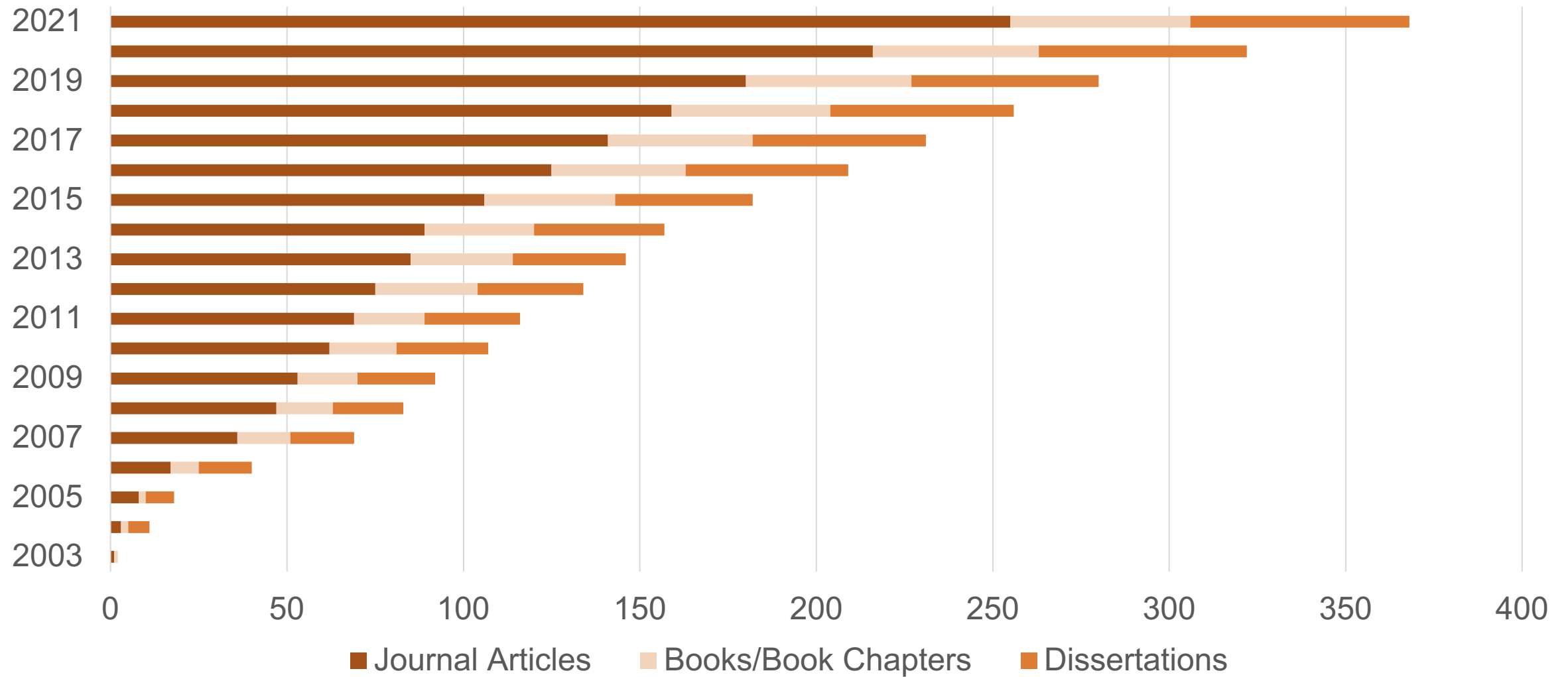
- National representation, relatively large urban/rural sample
- Longitudinal; high response rate, low attrition/loss
- Mortality as an outcome in the panel
- Linked to external sources (mortality rates, air pollution, social programs enrollment, etc.)
- Well positioned to study the impact of shocks and changes in policies or programs
- Comparable to other studies: cross-national comparisons

Priority to Use and Share Data

- Bilingual website

- New re-designed website launched June 2022
- Dynamic data repository with free access
 - Databases and codebooks
 - Documentation in both languages
 - Search engine for publications using MHAS data
 - Q&A Repository
 - Constructed data
 - Imputations for non-response of selected variables
 - Created variables
 - Harmonized data and documentation

Cumulative Number of Publications Using the MHAS by Year



Publications using MHAS Data

- Users' Accomplishments (to Dec. 2022)
 - 265 peer reviewed journal publications
 - 49 book chapters
 - 63 thesis, dissertations
 - Other research projects using the data
- Since the first release of the Harmonized MHAS data
 - Number of publications with cross-national comparisons increased from 13% in 2015 to about 20% in 2022.

Selected most recent publications

- Briceño EM, Arce Rentería M, Gross AL, Jones RN, Gonzalez C, Wong R, Weir DR, Langa KM, Manly JJ. A cultural neuropsychological approach to harmonization of **cognitive data** across culturally and linguistically diverse older adult populations. *Neuropsychology*. 2022 Apr 28. [Epub ahead of print]. PMID: 35482625.
- Lu W, Stefler D, Sanchez-Niubo A, Haro J, Marmot M, Bobak M. The associations of **physical incapacity and wealth** with remaining in paid employment after age 60 in five middle-income and high-income countries. *Ageing and Society*. 11 March 2022;1-24. doi: <https://doi.org/10.1017/S0144686X22000265>. In Process at NIHMS. NIHMS ID 1812304.
- McEniry M. **Early Life Conditions and Older Adult Health** in Low and Middle Income Countries: A Review. *Journal of the Developmental Origins of Health and Disease*. 2013 Feb;4(1):10-29. PMID: 23316272; PMCID: PMC3540412.
- Lu P, Shelley M. **Retirement, Pensions and Depressive Symptoms** among Older Adults in China, England, Mexico, and the US. *Int J Aging Hum Dev*. 2021 Jan;92(1):40-64. doi: 10.1177/0091415019868227. [Epub 2019 Aug 13]. PMID: 31409091; PMCID: PMC9187976.
- Matus-Lopez M, Chaverri-Carvajal A. Population with **Long-Term Care Needs** in Six Latin American Countries: Estimation of Older Adults Who Need Help Performing ADLs. *Int J Environ Res Public Health*. 2021 Jul 27;18(15):7935. PMID: 34360226; PMCID: PMC8345476.

Current Main Collaborators for MHAS



Acknowledgments:

MHAS receives support from the National Institutes of Health, NIA/NIH in the U.S. (grant R01-AG018016) and INEGI in Mexico. MHAS ancillary studies are supported by R01-AG051158 and R56-AG059756. The study is a collaboration among several institutions in both countries.

Harmonized MHAS Example Analysis

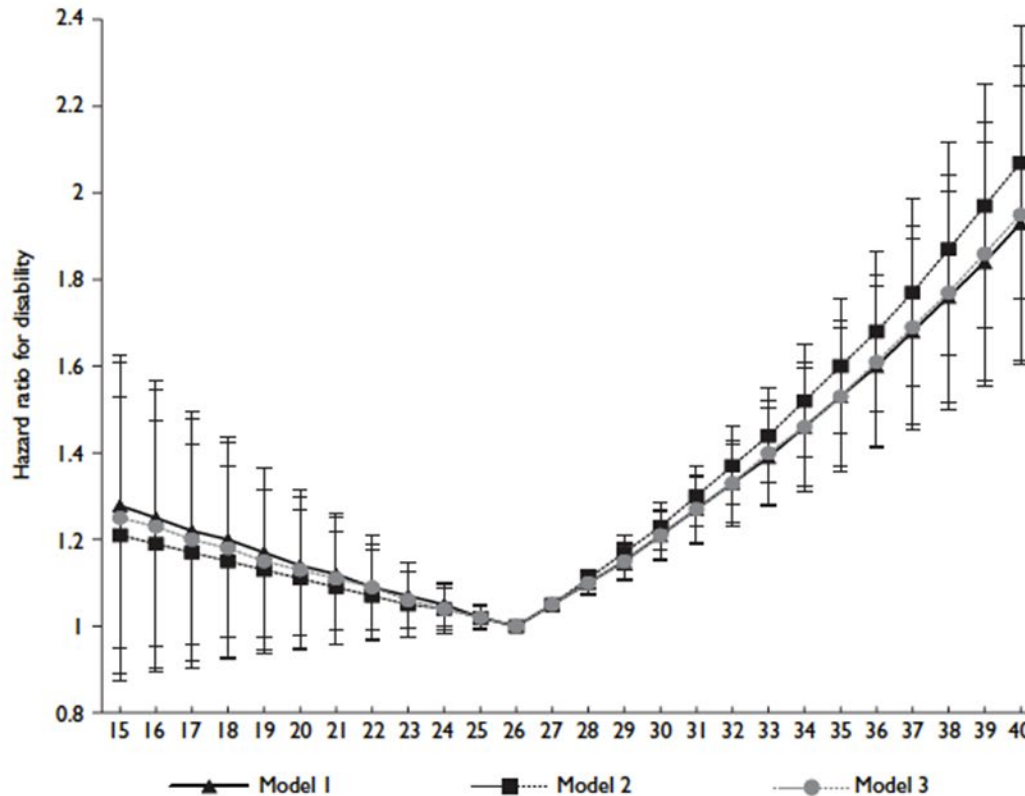
Example Analysis

Research question:

How does obesity affect the development of disability in Mexican older adults?
Do we see the same pattern in other countries?

Risk of Disability by BMI – 11 year follow-up

Source: Kumar et al. (2015)
using MHAS 2001, 2003,
2012 data

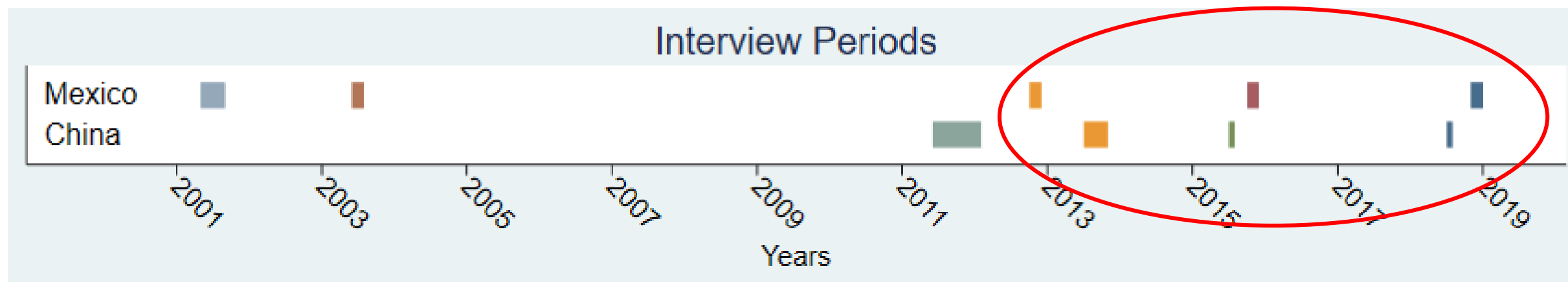


Data was collected in Mexico in year 2001, 2003, and 2012
ADL=Activities of daily living
BMI=body mass index

FIGURE 1. HAZARD RATIOS PREDICTING ADL DISABILITY DURING 11-YEAR OF FOLLOW-UP AS A FUNCTION OF BMI AMONG NON-DISABLED MEXICANS OLDER ADULTS AT BASELINE. MODEL 1 WAS ADJUSTED FOR SOCIO-DEMOGRAPHIC CHARACTERISTICS AND BASELINE COMORBIDITIES. MODEL 2 WAS NOT ADJUSTED FOR BASELINE COMORBIDITIES. MODEL 3 EXCLUDED CURRENT SMOKERS AND THOSE WHO DIED DURING THE FIRST 5 YEARS OF FOLLOW-UP, AND WAS ADJUSTED FOR BASELINE COMORBIDITIES. VALUES ARE HAZARD RATIOS (95% CONFIDENCE INTERVAL)

Example Analysis

MHAS and CHARLS



Example Analysis

Steps:

1. Download Harmonized MHAS dataset
2. Download the Harmonized CHARLS dataset
3. Identify relevant variables
4. Create a pooled dataset
5. Adjust for different wave numbers in variable names
6. Reshape data from wide to long
7. Create additional variables
8. Analyze impact of obesity on disability onset by country

Example Analysis

Download the Harmonized MHAS dataset

From MHAS
website:
mhasweb.org

[Home](#) > Harmonized Data

Harmonized Data

The Harmonized MHAS data is produced in collaboration with the Gateway to Global Aging Data project. The Gateway to Global Aging Data (www.g2aging.org) is a web-based resource for accessing multidisciplinary panel data on aging, health, and retirement from the international family of Health and Retirement surveys.

The Harmonized MHAS data file incorporates data from the core interview data, the master follow-up file, household roster data, and next-of-kin data. Also available is the Harmonized MHAS End of Life file focusing on the next-of-kin interview and a Harmonized Mex-Cog file focusing on the MHAS Cognitive Ancillary Study. For more information about these data files please refer to the following links.

Harmonized MHAS File (H MHAS) (Latest release: Version C)

[H MHAS Data File](#)
[STATA Creation Code](#)
[H MHAS Codebook](#)

MHAS Cognitive Aging Ancillary Study Imputations

† [Coming soon](#)

Harmonized MHAS End of Life (Latest release: Version B)

[H MHAS EOL Data file](#)
[H MHAS EOL Codebook](#)
[STATA Creation Code](#)

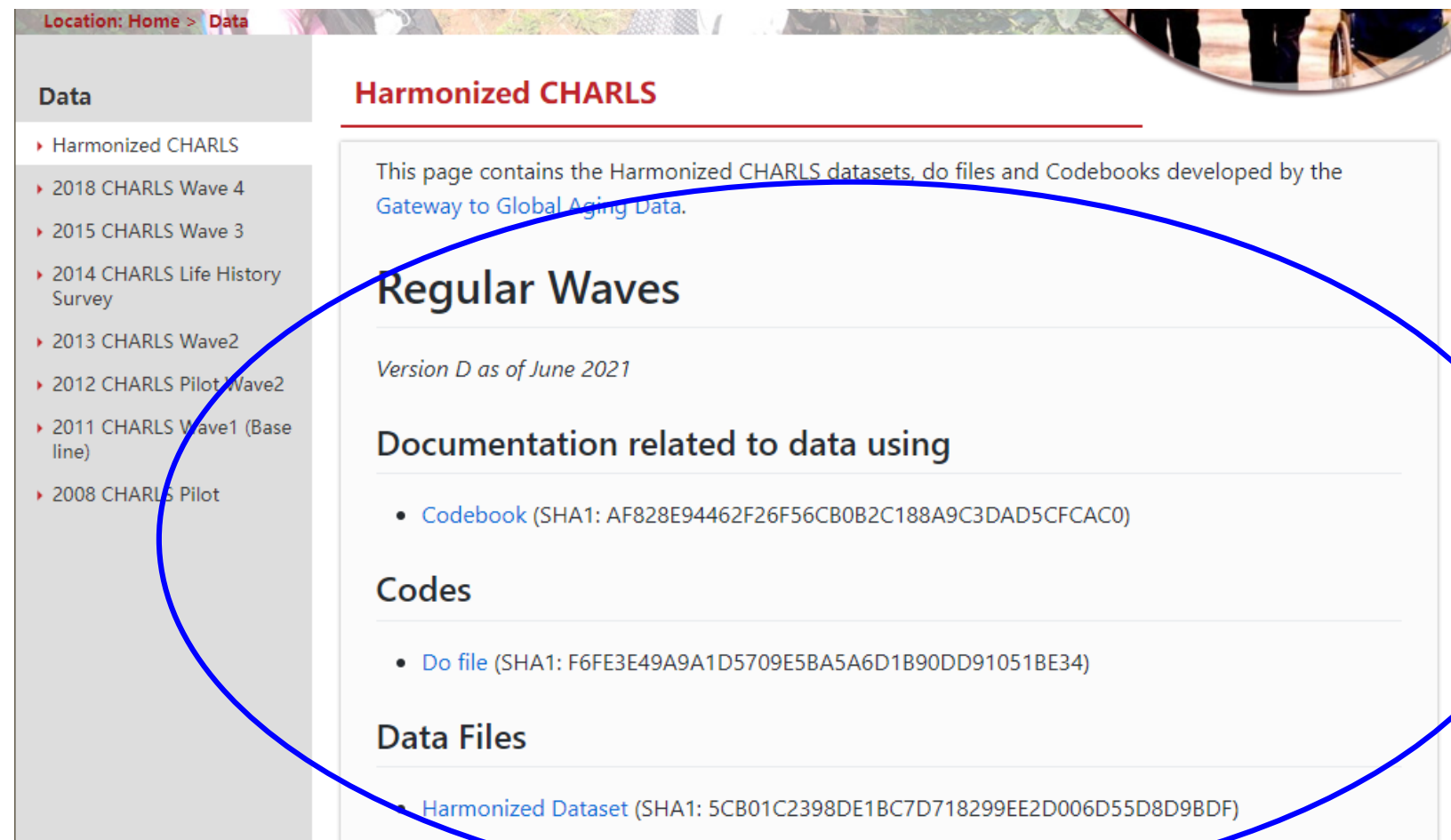
Harmonized (Mex-Cog)

† [Coming soon](#)

Example Analysis

Download the Harmonized CHARLS dataset

From CHARLS
website:
charls.pku.edu.cn/en



Location: Home > Data

Data

- ▶ Harmonized CHARLS
- ▶ 2018 CHARLS Wave 4
- ▶ 2015 CHARLS Wave 3
- ▶ 2014 CHARLS Life History Survey
- ▶ 2013 CHARLS Wave2
- ▶ 2012 CHARLS Pilot Wave2
- ▶ 2011 CHARLS Wave1 (Base line)
- ▶ 2008 CHARLS Pilot

Harmonized CHARLS

This page contains the Harmonized CHARLS datasets, do files and Codebooks developed by the Gateway to Global Aging Data.

Regular Waves

Version D as of June 2021

Documentation related to data using

- [Codebook](#) (SHA1: AF828E94462F26F56CB0B2C188A9C3DAD5CFCAC0)

Codes

- [Do file](#) (SHA1: F6FE3E49A9A1D5709E5BA5A6D1B90DD91051BE34)

Data Files

- [Harmonized Dataset](#) (SHA1: 5CB01C2398DE1BC7D718299EE2D006D55D8D9BDF)

Example Analysis

Identify relevant variables in Harmonized MHAS

Waves of interest: MHAS Wave 3 (2012), 4 (2015), 5 (2018)

- MHAS unique individual identifier: unhhidnp
- Indicators of participation at each wave: inw3, inw4, inw5
- 2012 person-level analysis weight: r3wtresp
- Gender: ragender
- Birth year: rabyear
- 2012 BMI: r3bmi, r3mbmi
- Age at each wave: r3agey, r4agey, r5agey
- ADL count at each wave: r3adlfive, r4adlfive, r5adlfive

Example Analysis

Identify relevant variables in Harmonized CHARLS

Waves of interest: CHARLS Wave 2 (2013), 3 (2015), 4 (2018)

- CHARLS unique individual identifier: ID
- Indicators of participation at each wave: inw2, inw3, inw4
- 2012 person-level analysis weight: r2wtresp
- Gender: ragender
- Birth year: rabyear
- 2012 BMI: r2mbmi
- Age at each wave: r2agey, r3agey, r4agey
- ADL count at each wave: r2adlfive, r3adlfive, r4adlfive

Example Analysis

Create pooled dataset

```
*Read in Harmonized MHAS observations and variables
use unhhidnp inw3 inw4 inw5 r3wtresp ragender rabyear r3bmi r3mbmi ///
    r3agey r4agey r5agey r3adlfive r4adlfive r5adlfive using H_MHAS_c.dta

*Read in Harmonized CHARLS observations and variables
append using H_CHARLS_d.dta, keep(ID inw2 inw3 inw4 r2wtresp ///
    ragender rabyear r2mbmi ///
    r2agey r3agey r4agey ///
    r2adlfive r3adlfive r4adlfive) ///
gen(append)
```


Example Analysis

Create pooled dataset

```
*Create indicator of country  
recode append (0=1 "Mexico") (1=2 "China"), gen(country)  
drop append
```

```
*Create cross-study person identifier  
egen pid = group(country unhhidnp ID), missing
```

Example Analysis

Adjust for different wave numbers in variable names

```
gen r2012pweight=.  
replace r2012pweight = r3wtresp if country == 1  
replace r2012pweight = r2wtresp if country == 2
```

```
gen r2012bmi=.  
replace r2012bmi = r3bmi if country == 1  
replace r2012bmi = r3mbmi if country == 1 & !mi(r3mbmi)  
replace r2012bmi = r2mbmi if country == 2
```

Example Analysis

Adjust for different wave numbers in variable names

```
gen r2012adlfive = .  
replace r2012adlfive = r3adlfive if country == 1  
replace r2012adlfive = r2adlfive if country == 2  
  
gen r2015adlfive = .  
replace r2015adlfive = r4adlfive if country == 1  
replace r2015adlfive = r3adlfive if country == 2  
  
gen r2018adlfive = .  
replace r2018adlfive = r5adlfive if country == 1  
replace r2018adlfive = r4adlfive if country == 2  
drop r?adlfive
```

Example Analysis

Adjust for different wave numbers in variable names

```
gen r2012agey =.  
replace r2012agey = r3agey if country == 1  
replace r2012agey = r2agey if country == 2
```

```
gen r2015agey =.  
replace r2015agey = r4agey if country == 1  
replace r2015agey = r3agey if country == 2
```

```
gen r2018agey =.  
replace r2018agey = r5agey if country == 1  
replace r2018agey = r4agey if country == 2  
drop r?agey
```

Example Analysis

Adjust for different wave numbers in variable names

```
gen inw2012 = .  
replace inw2012 = inw3 if country == 1  
replace inw2012 = inw2 if country == 2
```

```
gen inw2015 = .  
replace inw2015 = inw4 if country == 1  
replace inw2015 = inw3 if country == 2
```

```
gen inw2018 = .  
replace inw2018 = inw5 if country == 1  
replace inw2018 = inw4 if country == 2  
drop inw?
```

Example Analysis

Reshape data from wide to long

```
reshape long r@adlfive inw@ r@agey h@rural, i(pid) j(year)  
label variable year ""
```

```
*Keep only waves with a response  
keep if inw == 1
```

Example Analysis

Create additional variables

*Create indicator of any ADL difficulty

```
egen ranyadl = cut(radlfive), at(0,1,6) icode
```

*Create indicator of any ADL difficulty in 2012

```
gen r2012anyadl = ranyadl if year == 2012
```

```
bysort pid (year): replace r2012anyadl = r2012anyadl[1]
```

*Create indicator of birth cohorts

```
egen rabyearcohort = cut(rabyear), at(1940,1950,1960,1970)
```

Example Analysis

Create additional variables

```
egen r2012obese = cut(r2012bmi), at(0,30,100) icode  
label define obese 0 "not obese" 1 "obese"  
label values r2012obese obese
```

```
*Count number of waves participated in  
bysort unhhidnp ID: gen wavecount = sum(inw)  
bysort unhhidnp ID: replace wavecount = wavecount[_N]
```

```
*Create flag for analysis sample  
gen sample = 0  
replace sample = 1 if inlist(rabyearcohort,1940,1950,1960) & wavecount ==  
3 & r2012anyadl == 0 & !mi(r2012obese)
```


Example Analysis

Analyze impact of obesity on disability onset by country

*Check sample descriptives

```
tab r2012obese country if sample & year == 2012,m col
```

```
tab ranyadl country if sample & year == 2012,m col
```

```
tab ranyadl country if sample & year == 2015,m col
```

```
tab ranyadl country if sample & year == 2018,m col
```

Example Analysis

Analyze impact of obesity on disability onset by country

```
*Generate weights for pooled data
gen r2012pweight_p = .
foreach country in 1 2 {
    qui sum r2012pweight if country == `country' & r2012pweight > 0 ///
        & year == 2012
    replace r2012pweight_p = r2012pweight * `r(N)'/`r(sum)' ///
        if country == `country' & r2012pweight > 0
}

*Adjust for multiple country sampling and apply weights
svyset [pw=r2012pweight_p], strata(country)
svydes
```

Example Analysis

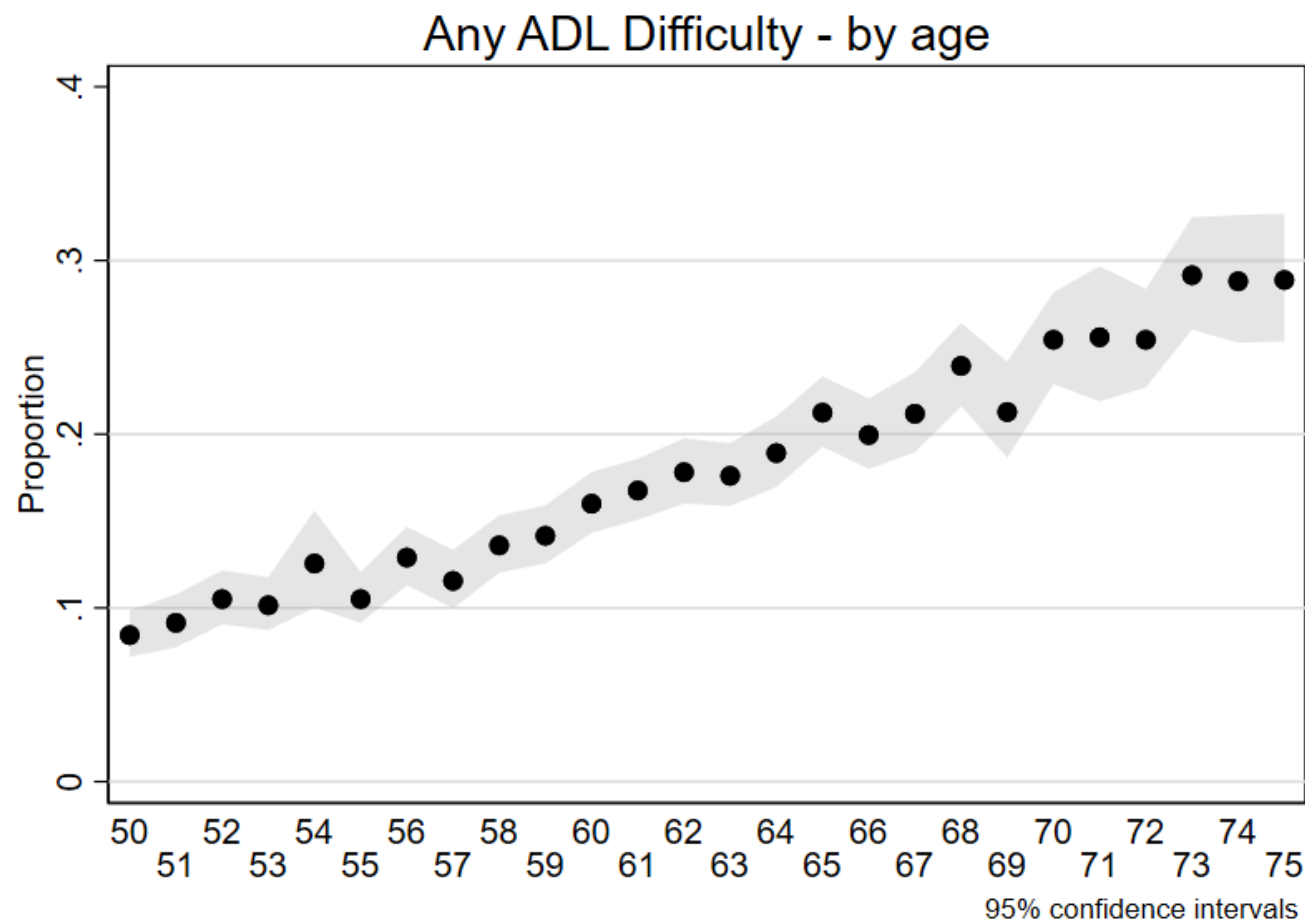
Analyze impact of obesity on disability onset by country

*Analyze disability prevalence across ages

```
svy, subpop(if inrange(ragey, 50, 75)): proportion ranyadl, over(ragey)
```

Example Analysis

Analyze impact of obesity on disability onset by country



Example Analysis

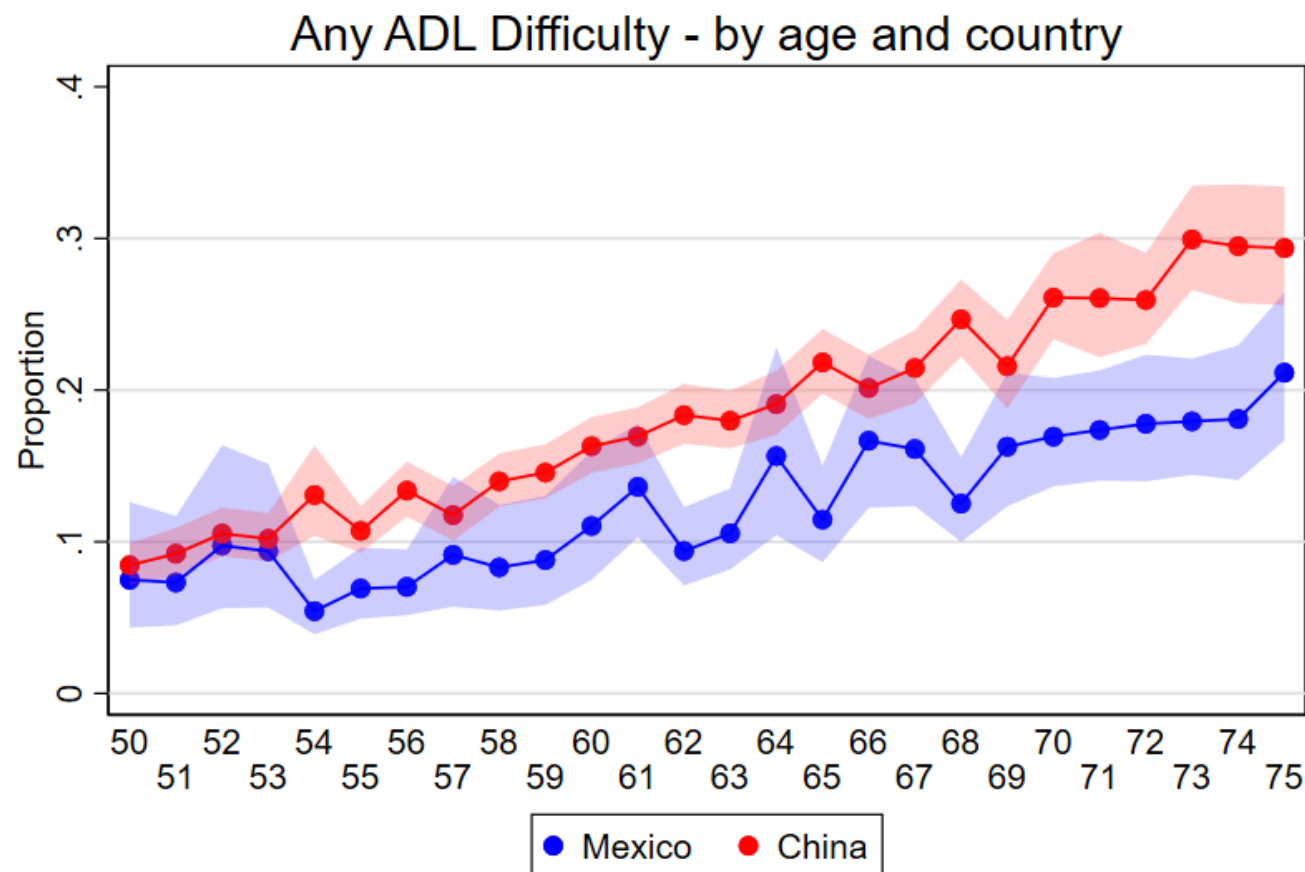
Analyze impact of obesity on disability onset by country

*Analyze disability prevalence across ages by country

```
svy, subpop(if inrange(ragey, 50, 75)): proportion ranyadl, over(ragey  
country)
```

Example Analysis

Analyze impact of obesity on disability onset by country



95% confidence intervals

Example Analysis

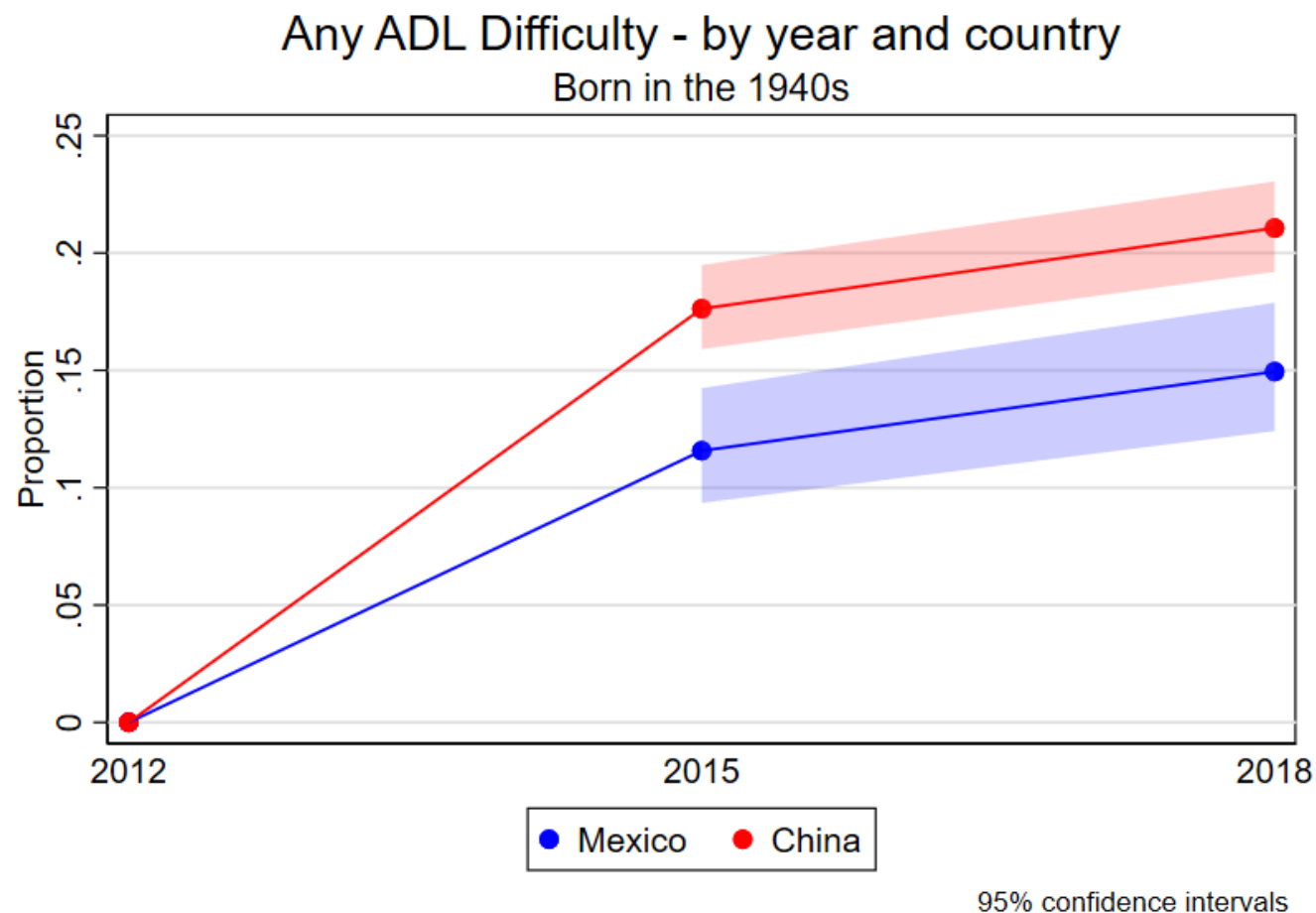
Analyze impact of obesity on disability onset by country

*Analyze disability prevalence across time by country for sample born in 1940s

```
svy, subpop(if sample & rabyearcohort == 1940): proportion ranyadl,  
over(year country)
```

Example Analysis

Analyze impact of obesity on disability onset by country



Example Analysis

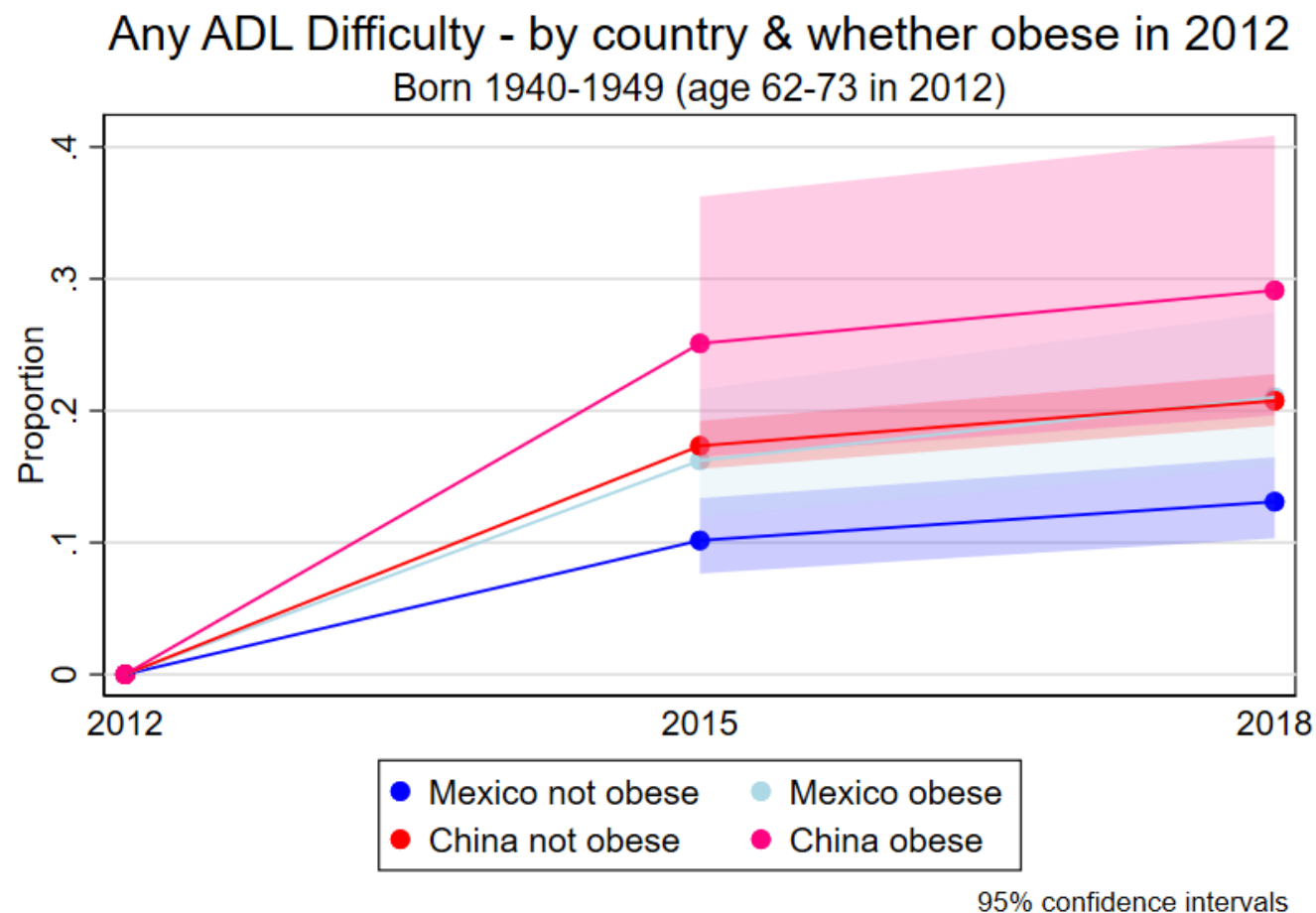
Analyze impact of obesity on disability onset by country

*Analyze disability prevalence across time by obesity and country for sample born in 1940s

```
svy, subpop(if sample & rabyearcohort == 1940): proportion ranyadl,  
over(year country r2012obese)
```

Example Analysis

Analyze impact of obesity on disability onset by country



Example Analysis

Analyze impact of obesity on disability onset by country

```
*Set up as panel data  
xtset pid year
```

```
*Examine variables as panel data  
bysort country: xtsum ragey if sample
```

```
bysort country: xttab ranyadl if sample
```

```
bysort country: xttrans ranyadl if sample, freq
```

Example Analysis

Analyze impact of obesity on disability onset by country

*Estimate the odds ratio of developing an ADL difficulty with a population-averaged logit model

```
xtlogit ranyadl r2012obese##country i.rabyearcohort i.ragender if sample  
[pweight=r2012pweight_p], pa or baselevels
```

Questions and Comments

Visit the MHAS site us at mhasweb.org

Email MHAS team: info@MHASWeb.org

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Email the Gateway team : help@g2aging.org

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