Evaluating the Completeness of Death Registration for Developing Countries at Old Ages

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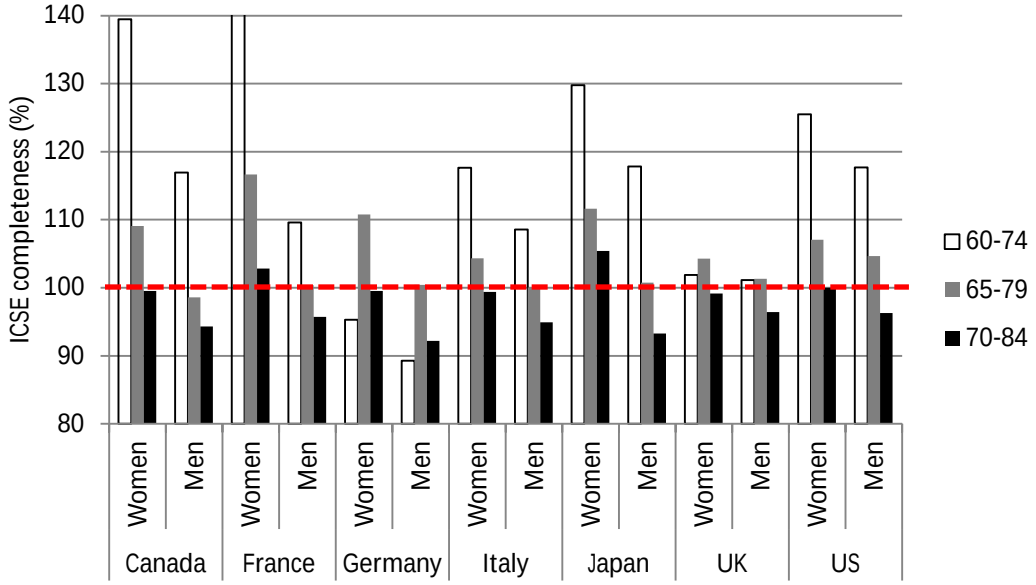
Views expressed in this presentation are those of the authors and do not necessarily reflect those of the United Nations.

For stable populations (Brass, 1975)

For non-

(III) Applying ICSE to the G7 countries in 2000-2010



We checked the data of Japan: Migration is negligible and census errors are less than 2% at old ages. We believe this is common for the other G7 countries.

Then, why are the errors of evaluation so large?

(IV) The errors of ICSE

$$E_c(s,u_1,u_2) \quad \frac{\hat{c} \quad c}{c} \quad \frac{d_R/\hat{d} \quad d_R/d}{d_R/d} \quad \frac{d \quad \hat{d}}{\hat{d}}$$

$$\frac{{}_1 \quad 2 \; [\hat{}_1 \quad \hat{}_2]}{[\hat{} \quad \hat{}\,]} \quad \frac{{}_1 \quad {}_2 \quad [\;{}_1(1 \quad {}_1) \quad {}_2(1 \quad u_2)]}{[p_1(1 \quad u_1) \quad p_2(1 \quad u_2)]}$$

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$$\frac{}{[\quad (1 \quad) \qquad (1 \quad)]} \quad \frac{1 \qquad [(1 \quad) \quad (1 \quad)]}{[(1 \quad) \quad (1 \quad)]}$$

$$\frac{u_1 \quad s \; u_2}{1 \quad s \quad (u_1 \quad s \; u_2)} \quad \frac{u}{1 \quad s \quad u}$$

This formula indicates two features about the errors of evaluation.

Feature 1: Evaluation error is bigger when mortality level is lower, and vise versa.

Feature 2: Over evaluation would occur more often than under evaluation.

$$\frac{s \;\; u_2}{1 \quad s \quad s \;\; u_2} \quad E_c(s,0,u_2) \quad E_c(s,u_1,u_2) \quad E_c(s,u_1,0) \quad \frac{u_1}{1 \quad s \quad u_1}$$

Conclusion: ICSE tends to work when mortality is high and completeness is low,

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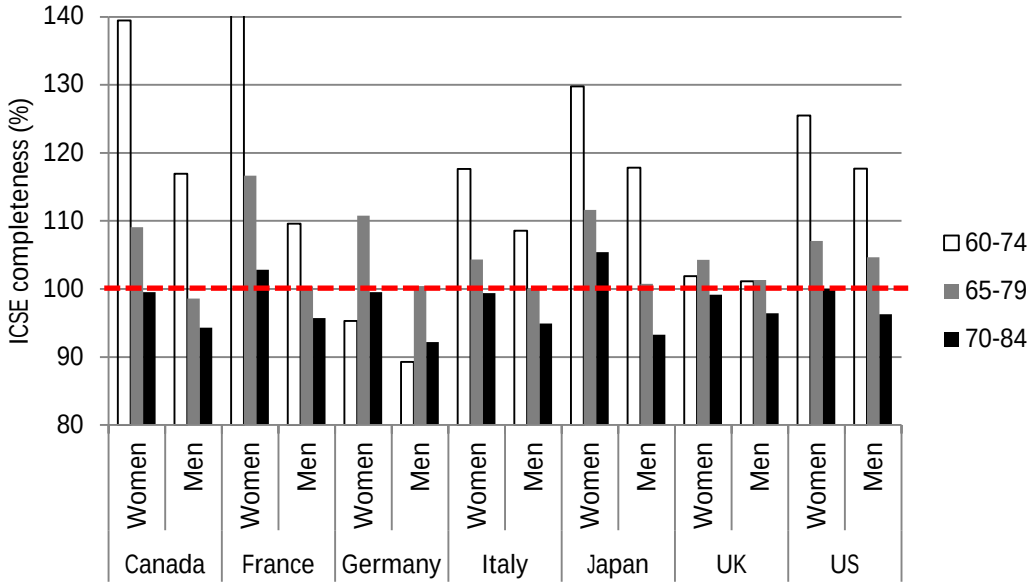
The two features can explain the details of the G7 applications.



Feature 1:

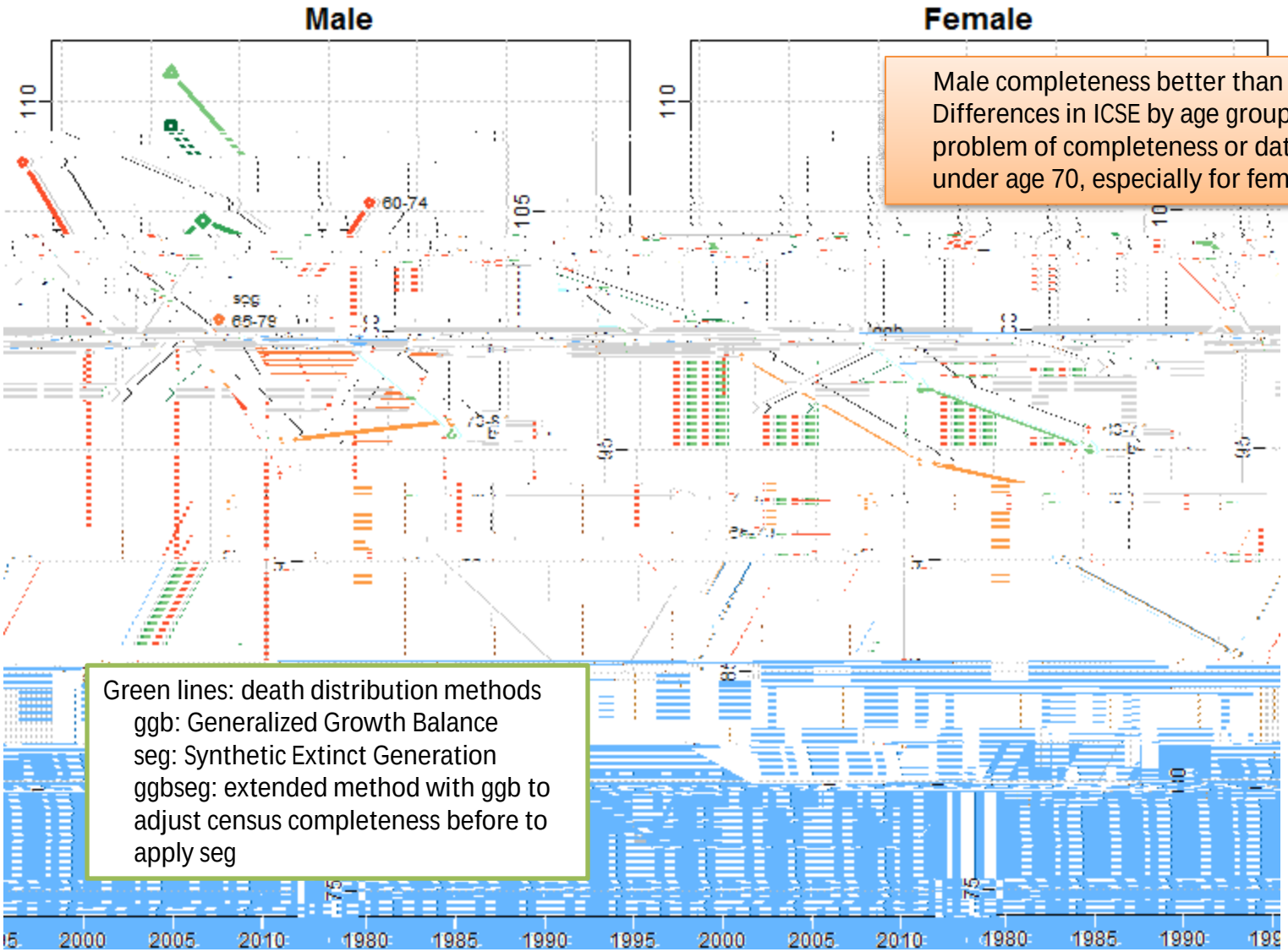
Female mortality are lower than that of male,
the evaluation errors of female (4.8%) are larger than that of male (2.3%).

Mortality levels at younger ages are lower than that at older ages,
the evaluation errors at younger ages are larger than that at older ages (8.5%, 2.6%, 1.1%).

Feature 2:

more over evaluations (>100, 28 out of 42) than under-evaluations (<98, 9 out of 42).

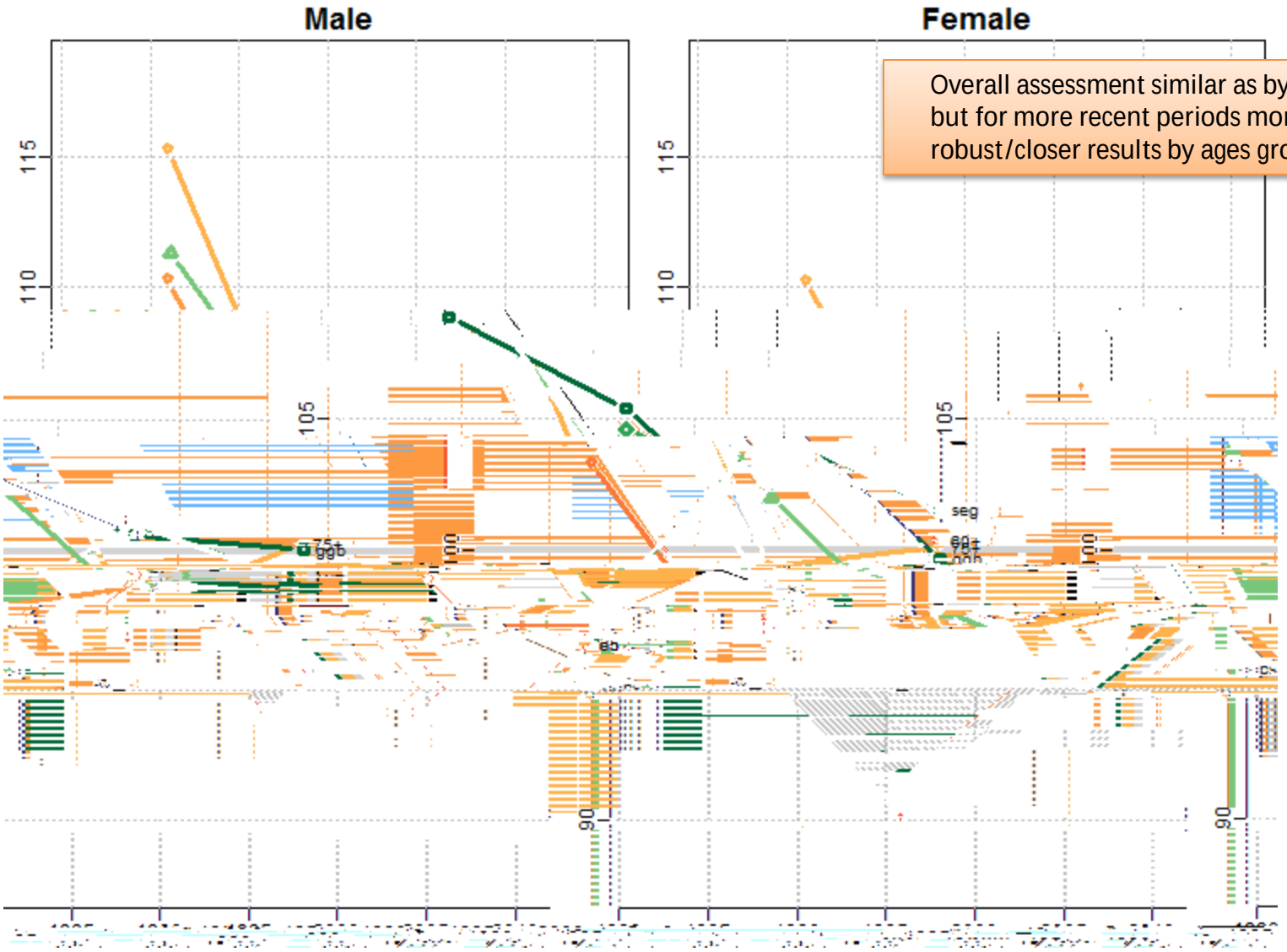
Brazil: 1980-2010 ς ICSE by age group



Male completeness better than for female
Differences in ICSE by age groups: greater problem of completeness or data quality under age 70, especially for female

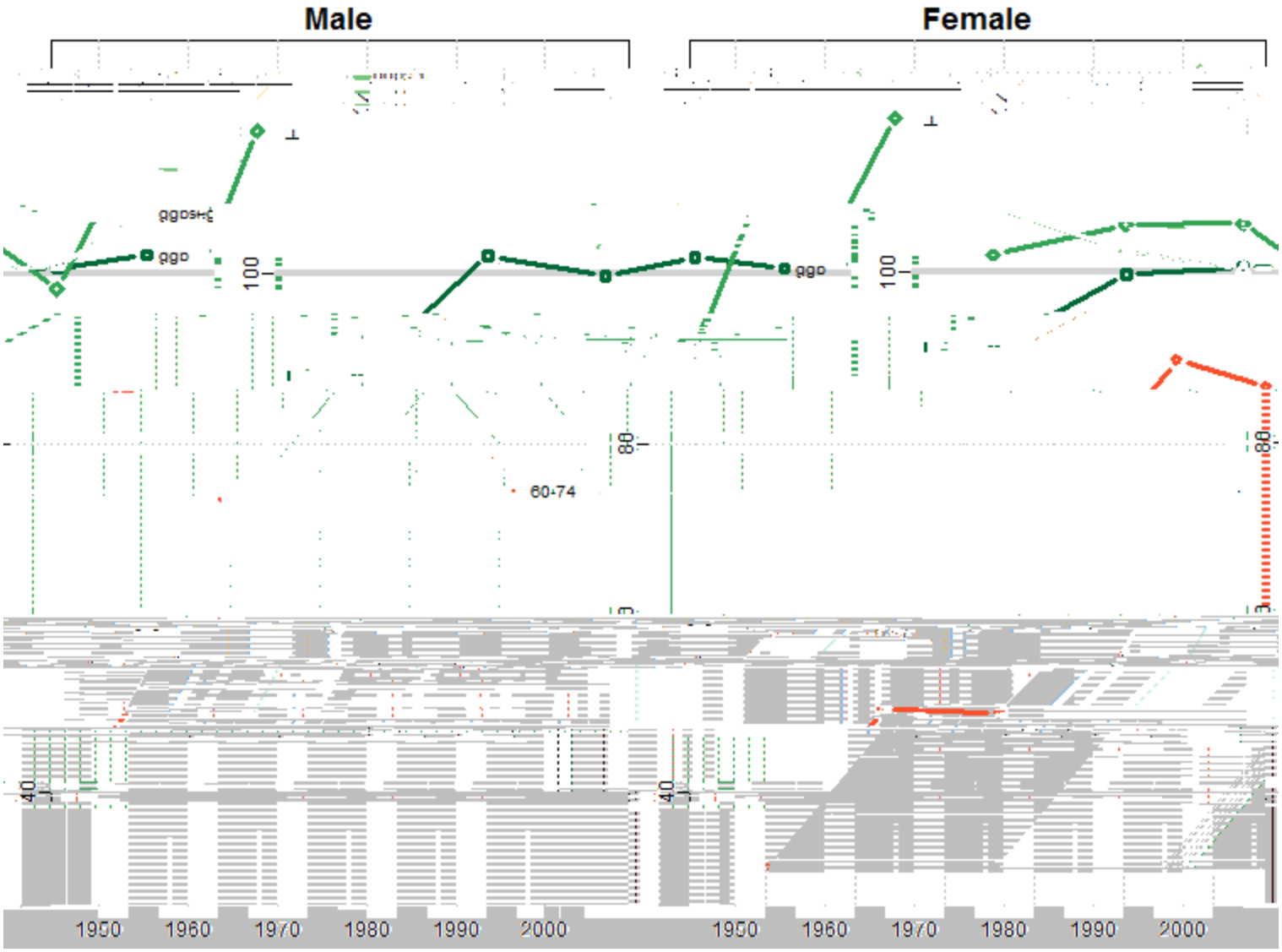
Green lines: death distribution methods
- ggb: Generalized Growth Balance
- seg: Synthetic Extinct Generation
- ggbseg: extended method with ggb to adjust census completeness before to apply seg

Brazil: 1980-2010 ς ICSE by open age group

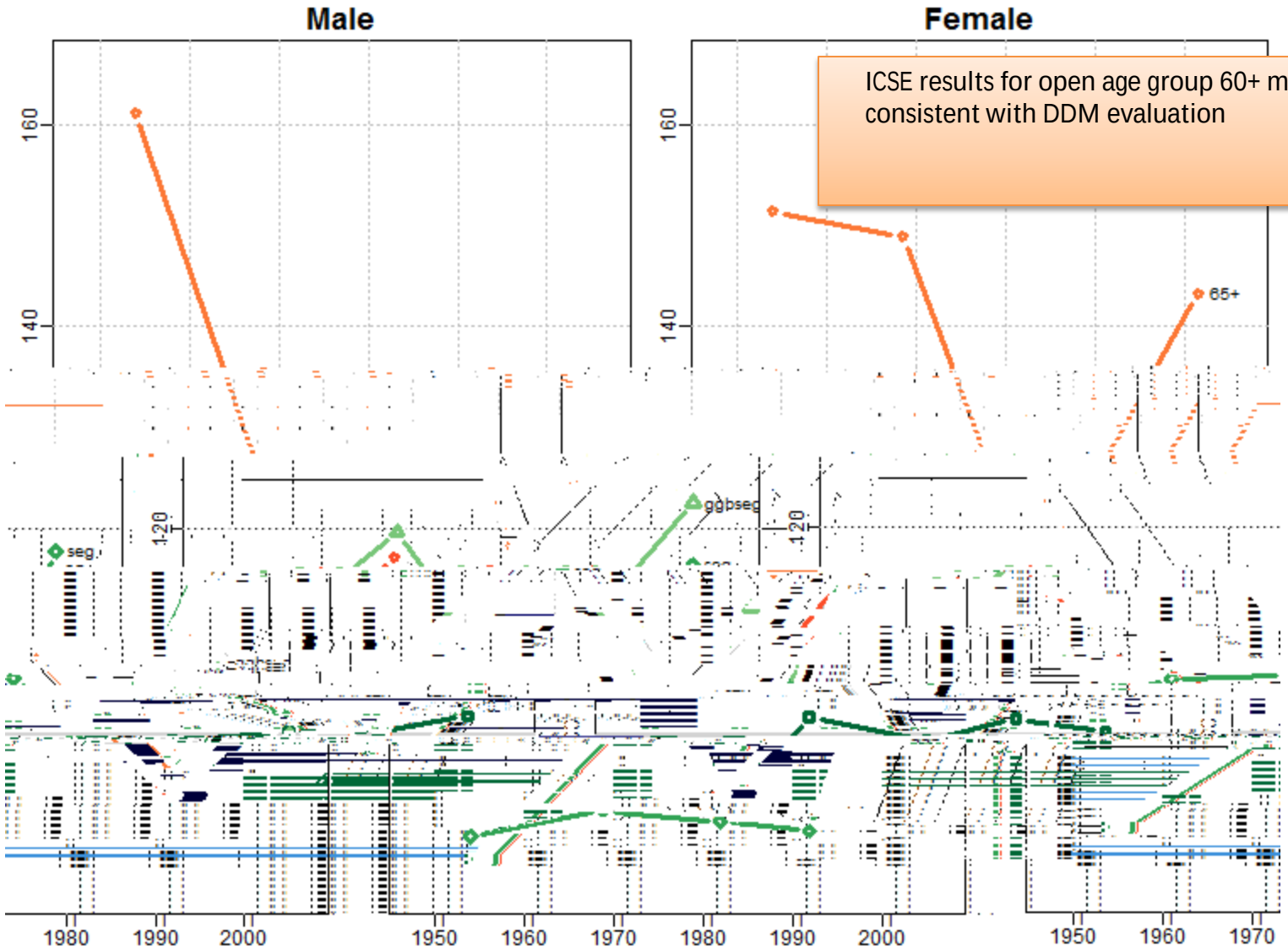


Overall assessment similar as by age group, but for more recent periods more robust/closer results by ages groups

Egypt: 1947-2006 ς ICSE by age group

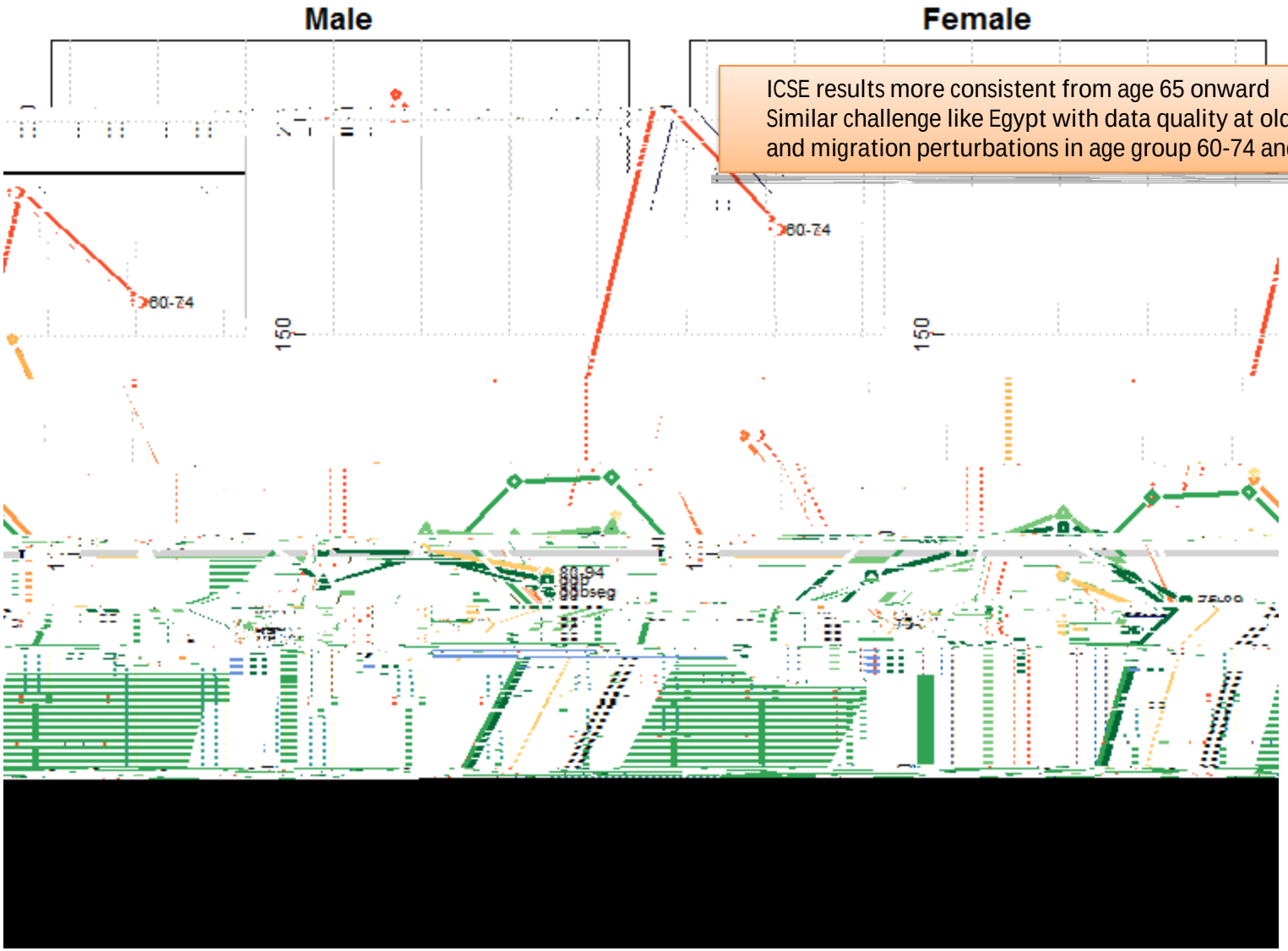


Egypt: 1947-2006 ς ICSE by open age group



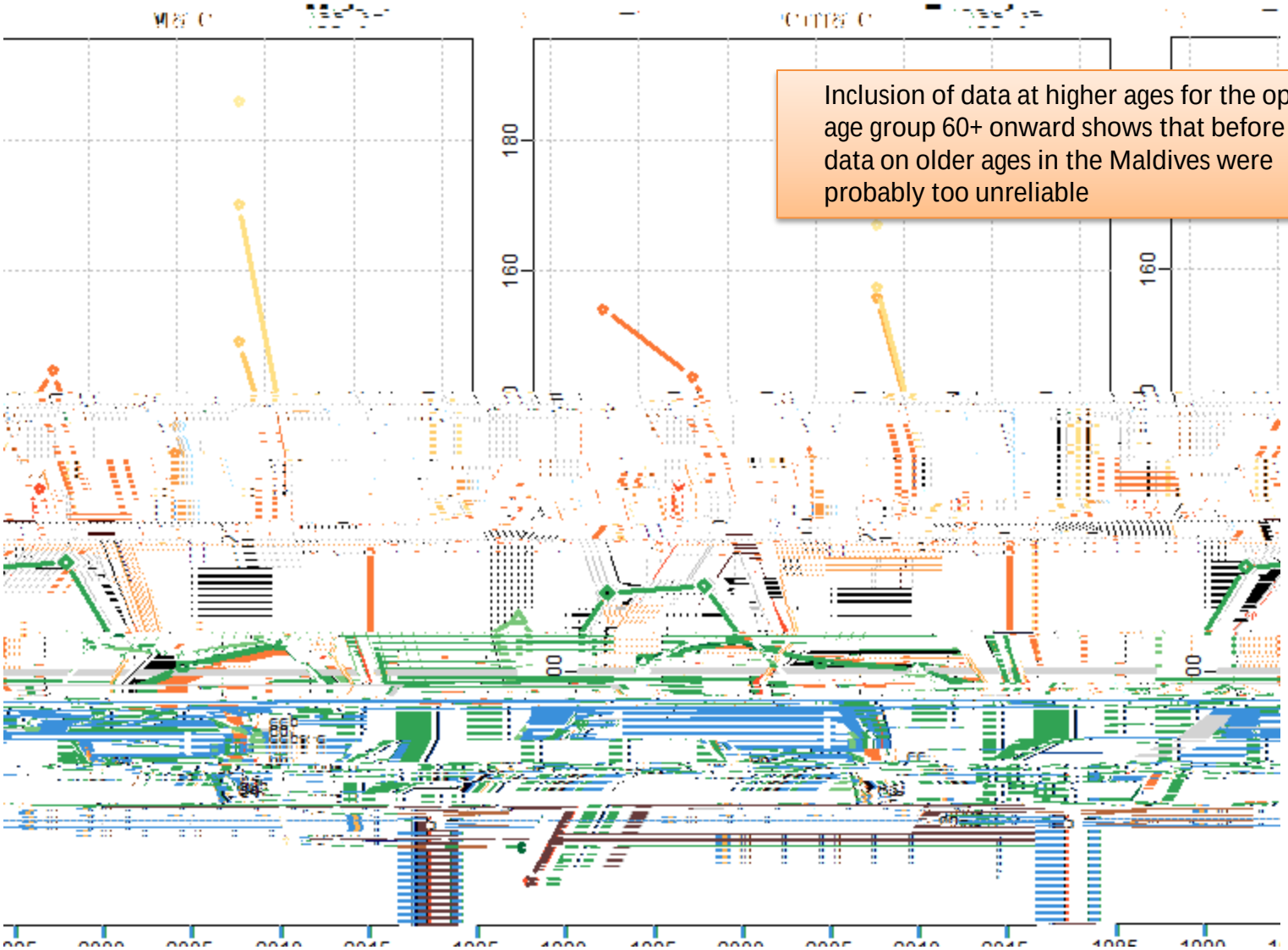
ICSE results for open age group 60+ more consistent with DDM evaluation

Maldives: 1985-2014 ς ICSE by age group



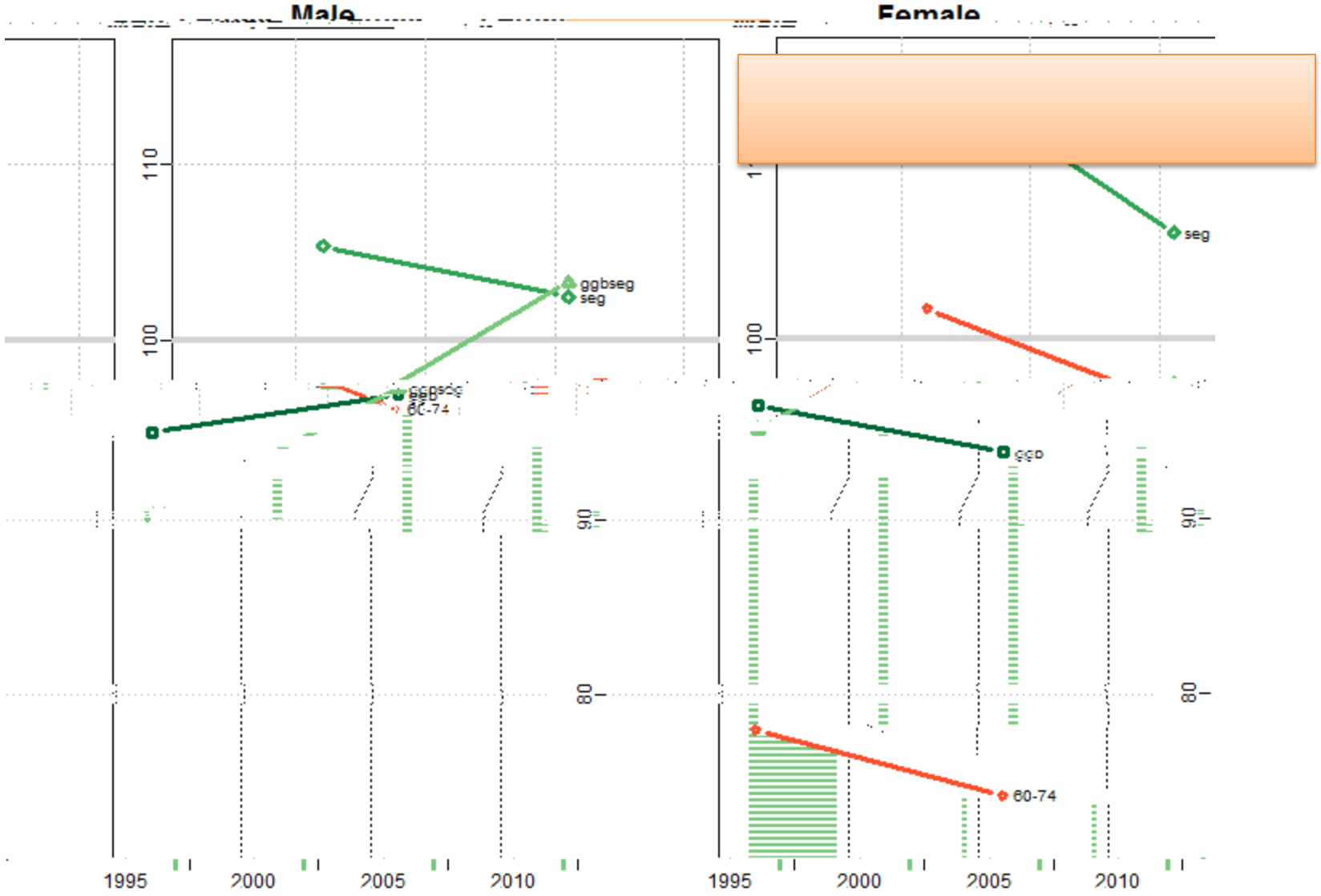
ICSE results more consistent from age 65 onward
Similar challenge like Egypt with data quality at older ages, and migration perturbations in age group 60-74 and < age 65

Maldives: 1985-2014 ς ICSE by open age group

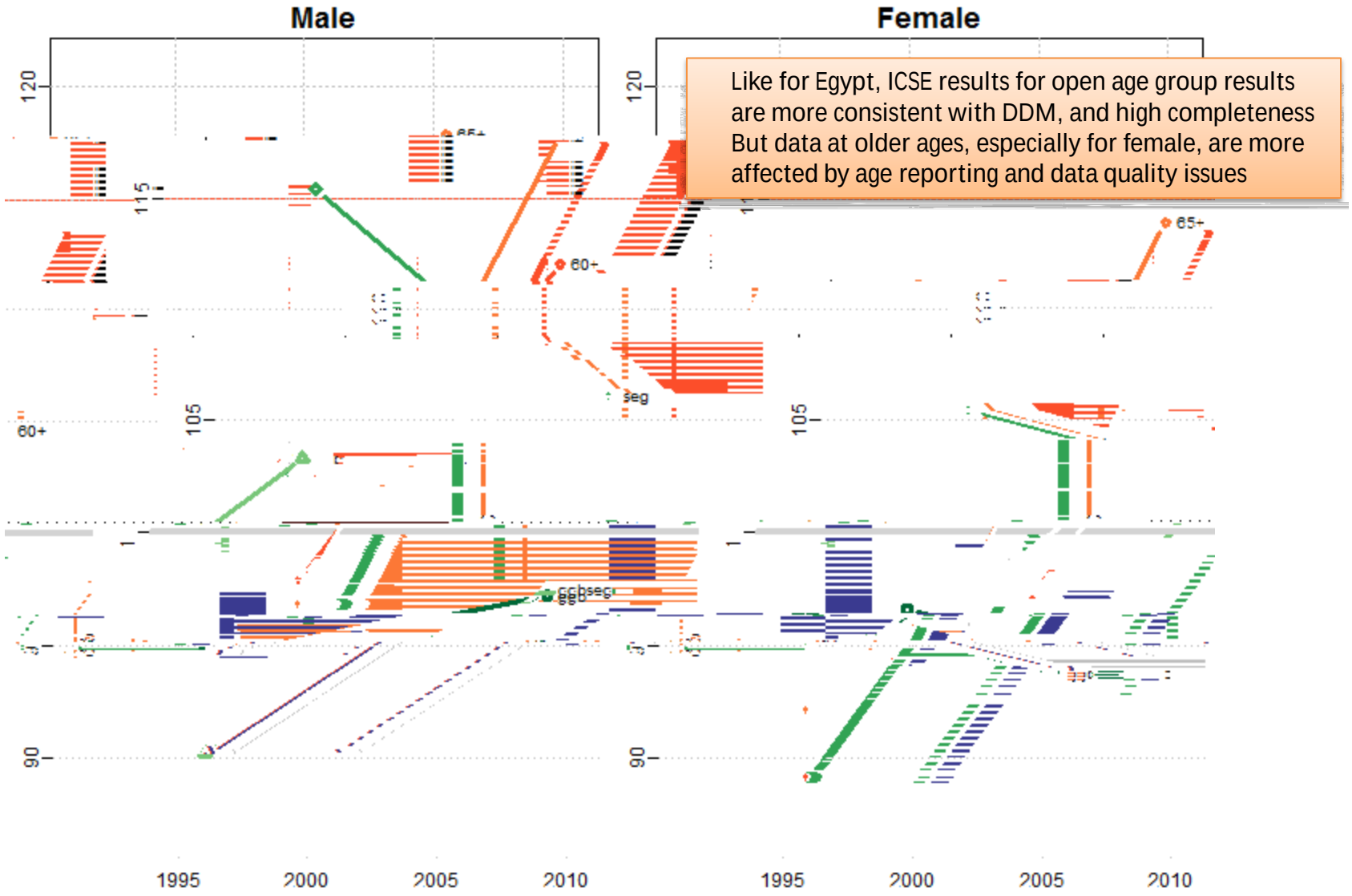


Inclusion of data at higher ages for the open age group 60+ onward shows that before 2000 data on older ages in the Maldives were probably too unreliable

Malaysia: 1991-2010 ς ICSE by age group

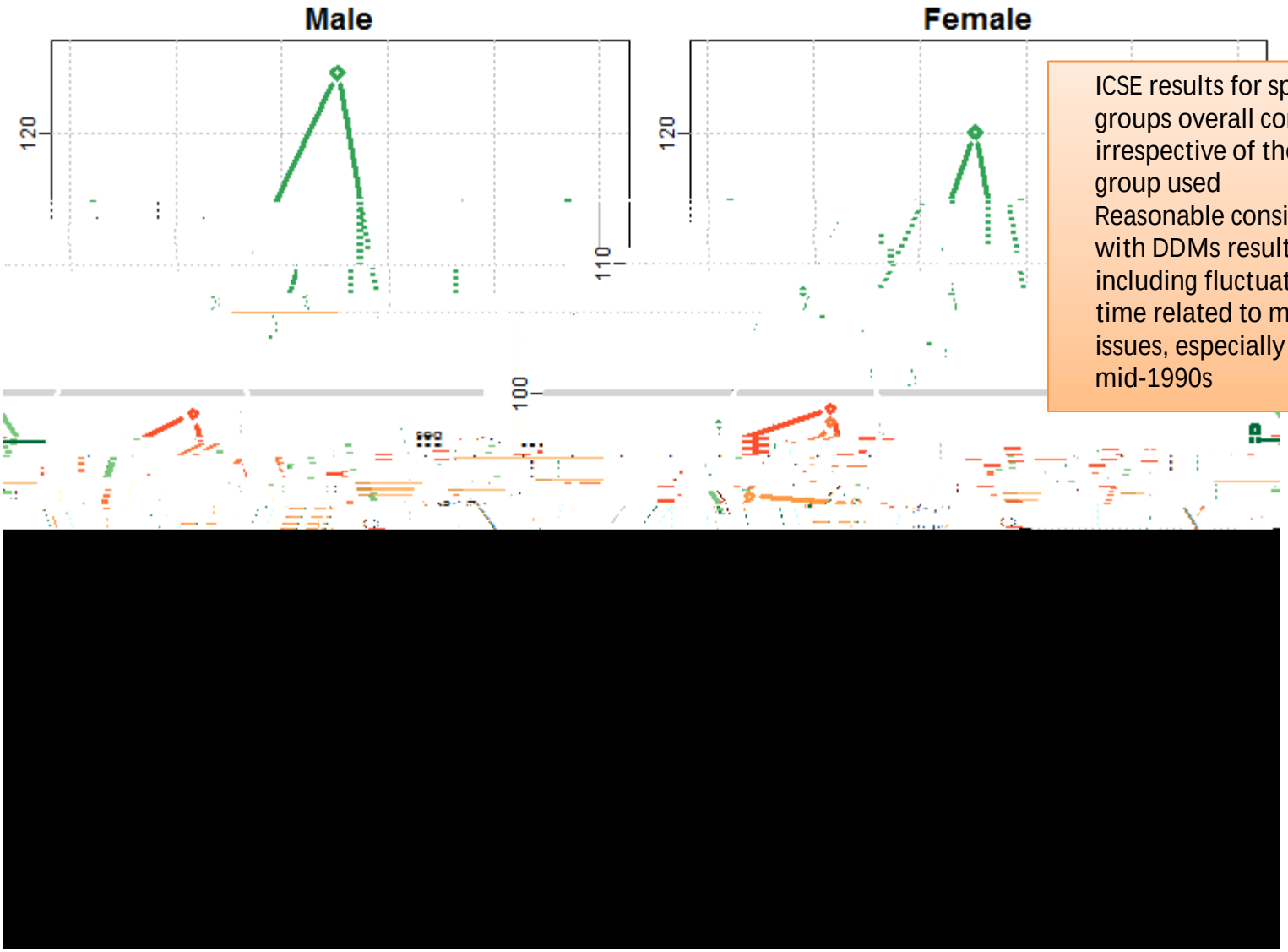


Malaysia: 1991-2010 ς ICSE by open age group



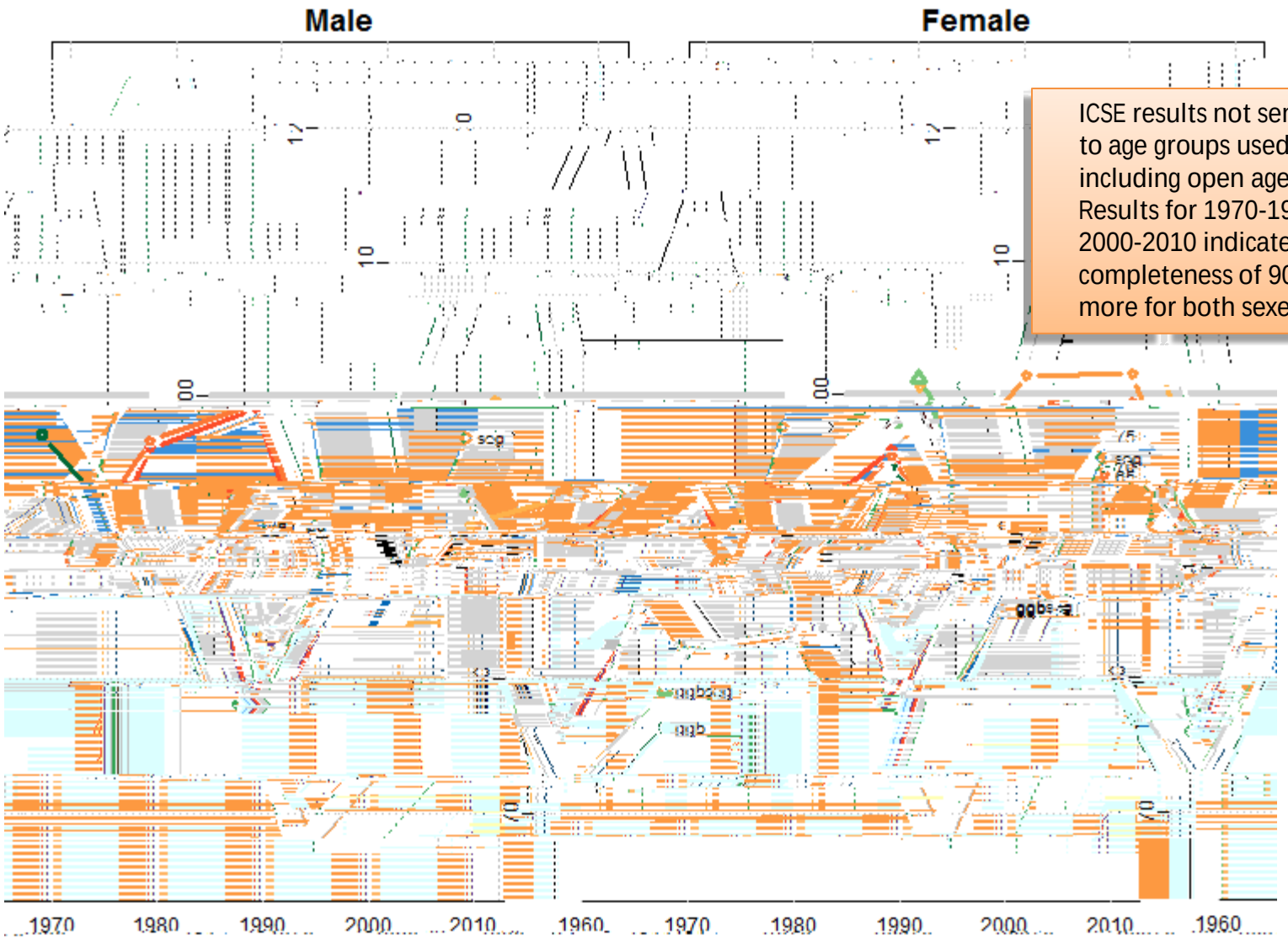
Like for Egypt, ICSE results for open age group results are more consistent with DDM, and high completeness
But data at older ages, especially for female, are more affected by age reporting and data quality issues

Thailand: 1960-2010 ς ICSE by age group



ICSE results for specific age groups overall consistent irrespective of the age group used
Reasonable consistency with DDMs results, including fluctuations over time related to migration issues, especially in the mid-1990s

Thailand: 1960-2010 ς ICSE by open age group



ICSE results not sensitive to age groups used, including open age group
Results for 1970-1990 and 2000-2010 indicate a high completeness of 90% or more for both sexes

Conclusion

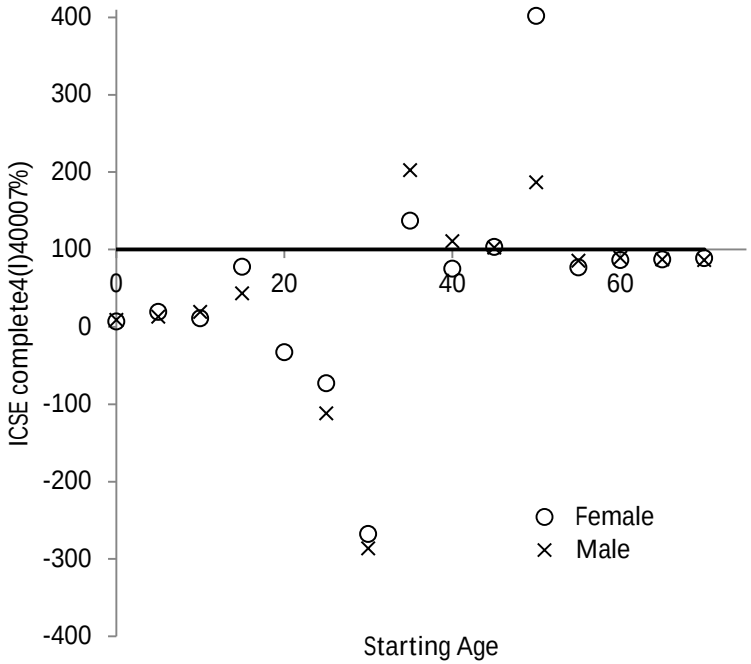
Paper focused on conditions under which census populations can be used to evaluate the completeness of DR:

focus on old ages where migration is negligible comparing to deaths

given the levels of census error, the lower the mortality level, the larger the evaluation error

1.

ICSE results for 2000-2010 in Thailand



ICSE cannot provide
rea9MC 4onable results to young

ICSE is unable to work for ages younger than 55 years, because of migration and low mortality.

Can we make an over-age average that may look better?
This is similar to using a gun to shoot a target:
missed the target too high about half of the time and too low another half,
and announce that the shooting was OK on average.

A potential solution for younger ages could be the Records Linkage Methods (RLM).

ICSE works for 60+ for Thailand.

But ICSE may still fail if the censuses failed to keep their errors moderate.