Reporting Guideline for total effect estimates

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Ref

The table 2 fallacy: presenting and interpreting confounder and modifier coefficients

D Westreich, S Greenland - American journal of epidemiology, 2013 - academic.oup.com

It is common to present multiple adjusted effect estimates from a single model in a single table. For example, a table might show odds ratios for one or more exposures and also for several confounders from a single logistic regression. This can lead to mistaken interpretations of these estimates. We use causal diagrams to display the sources of the problems. Presentation of exposure and confounder effect estimates from a single model may lead to several interpretative difficulties, inviting confusion of direct-effect estimates with …

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Example from the literature

News about COVID-19

Forbes

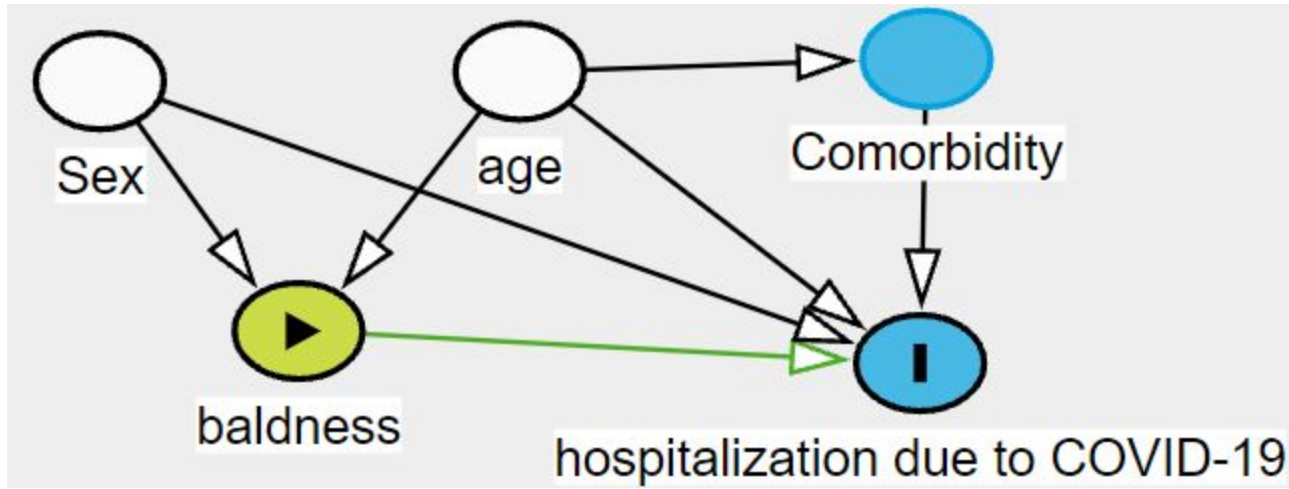CORONAVIRUS | Jun 6, 2020, 11:26am EDT | 167,239 views

Study Suggests Bald Men Could Be More At Risk For Severe Coronavirus, But More Research Is Needed
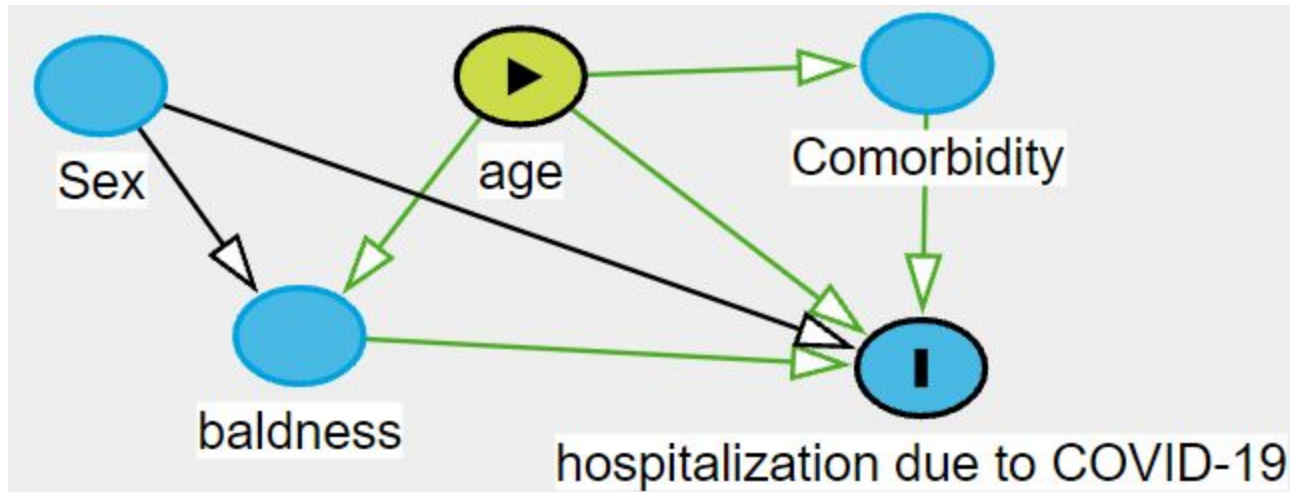
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A potential DAG when Baldness is exposure
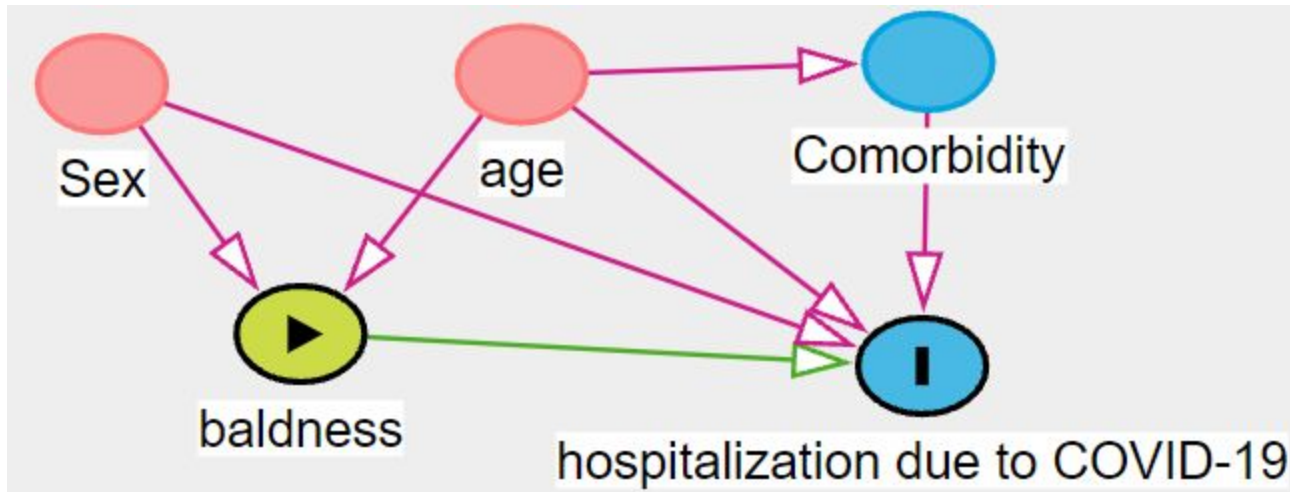
Draw a causal diagram (DAG) based on "analyst's best understanding of the literature".

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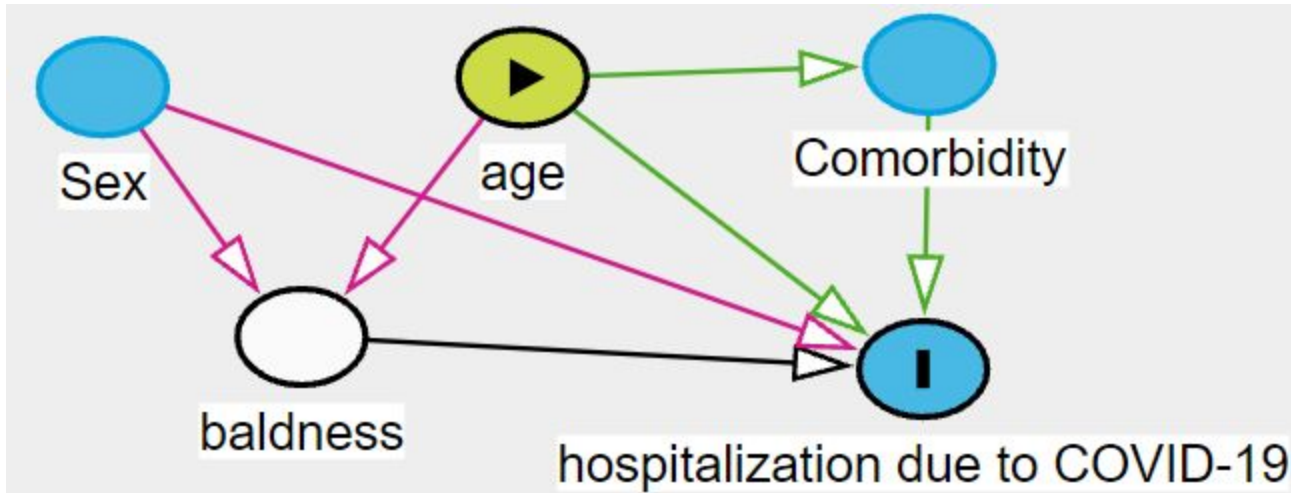# A potential DAG when Baldness is exposure

Minimal sufficient adjustment sets for estimating the total effect of baldness on hospitalization due to COVID-19: Sex, age
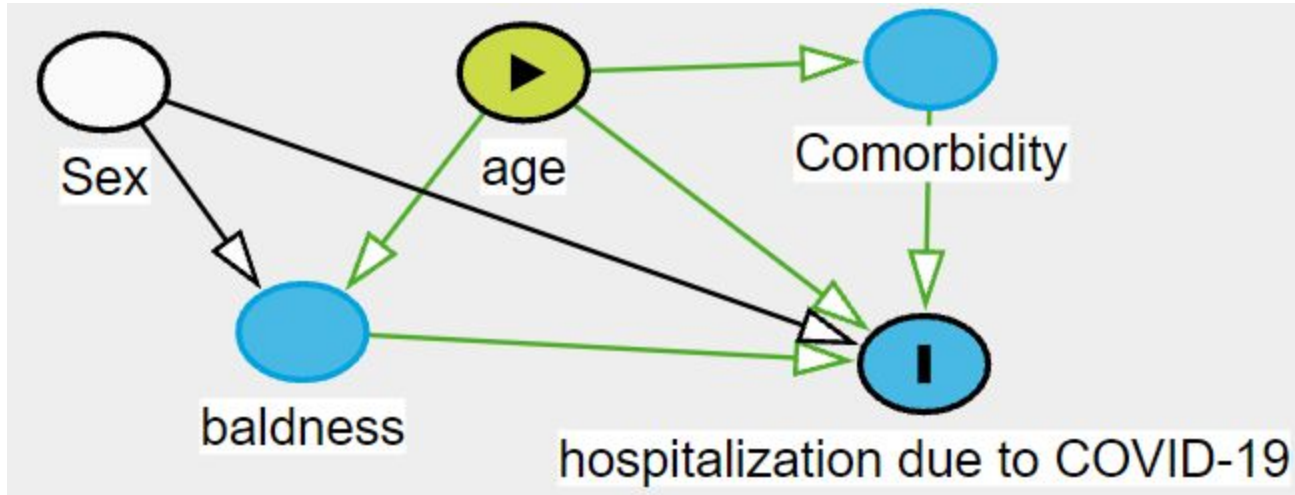
A potential DAG when Age is exposure

No adjustment is necessary to estimate the total effect of Sex on hospitalization due to COVID-19.

A potential DAG when Age is exposure

The total effect cannot be estimated due to adjustment for an intermediate or a descendant of an intermediate.

A potential DAG when Age is exposure

Minimal sufficient adjustment sets containing Sex for estimating the total effect of age on hospitalization due to COVID-19: Sex
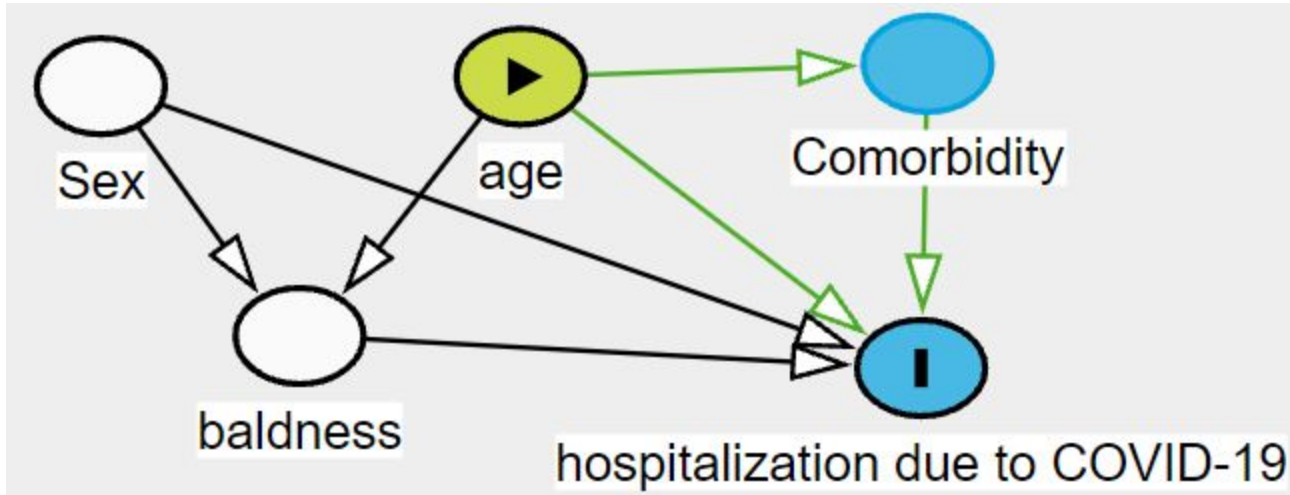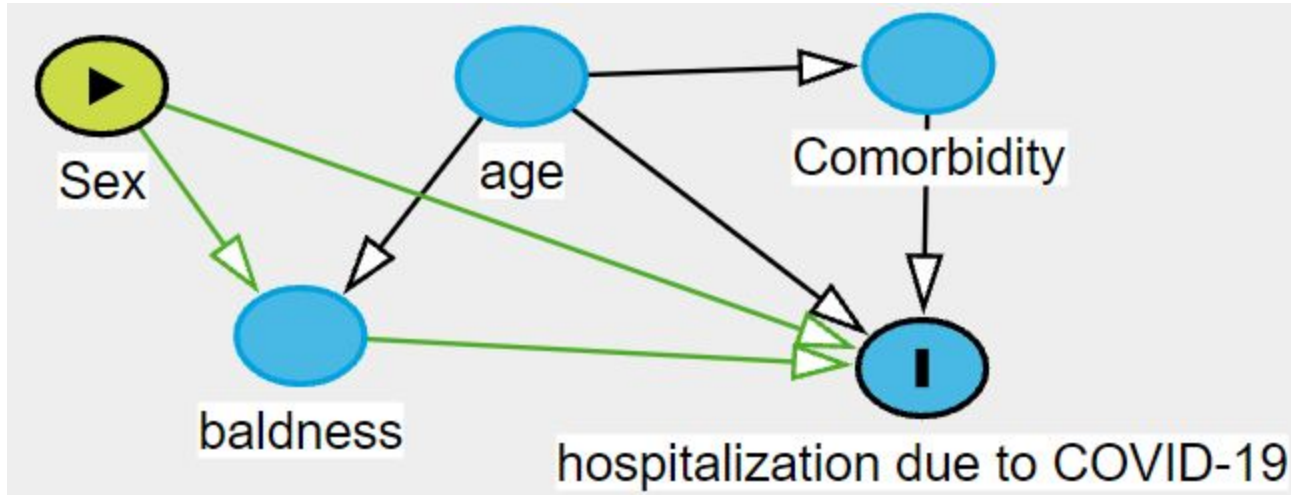
A potential DAG when Age is exposure

The total effect cannot be estimated due to adjustment for an intermediate or a descendant of an intermediate.

A potential DAG when Sex is exposure

No adjustment is necessary to estimate the total effect of Sex on hospitalization due to COVID-19.

A potential DAG when Sex is exposure

Minimal sufficient adjustment sets containing age for estimating the total effect of Sex on hospitalization due to COVID-19: age
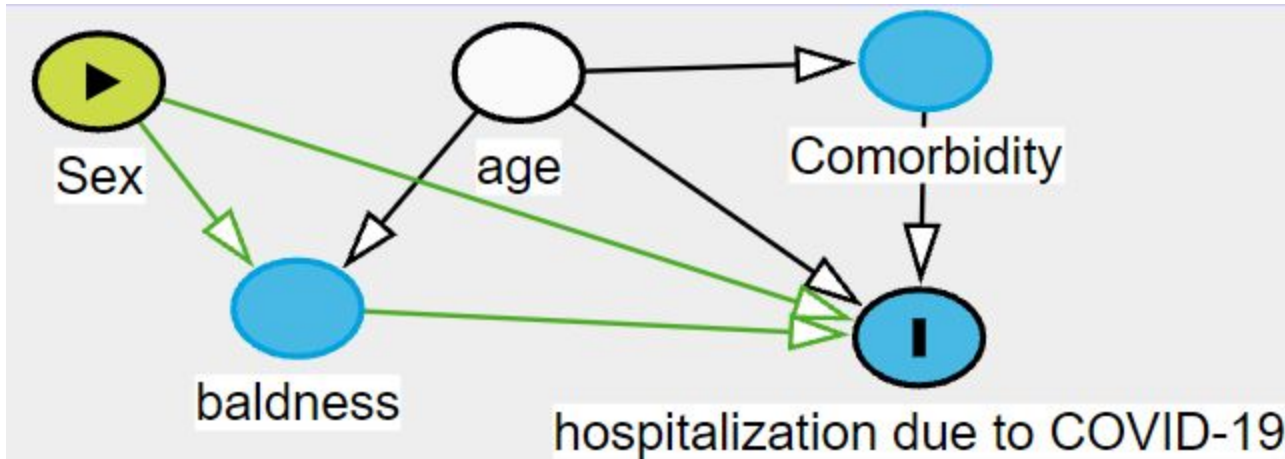
A potential DAG when Sex is exposure

The total effect cannot be estimated due to adjustment for an intermediate or a descendant of an intermediate.
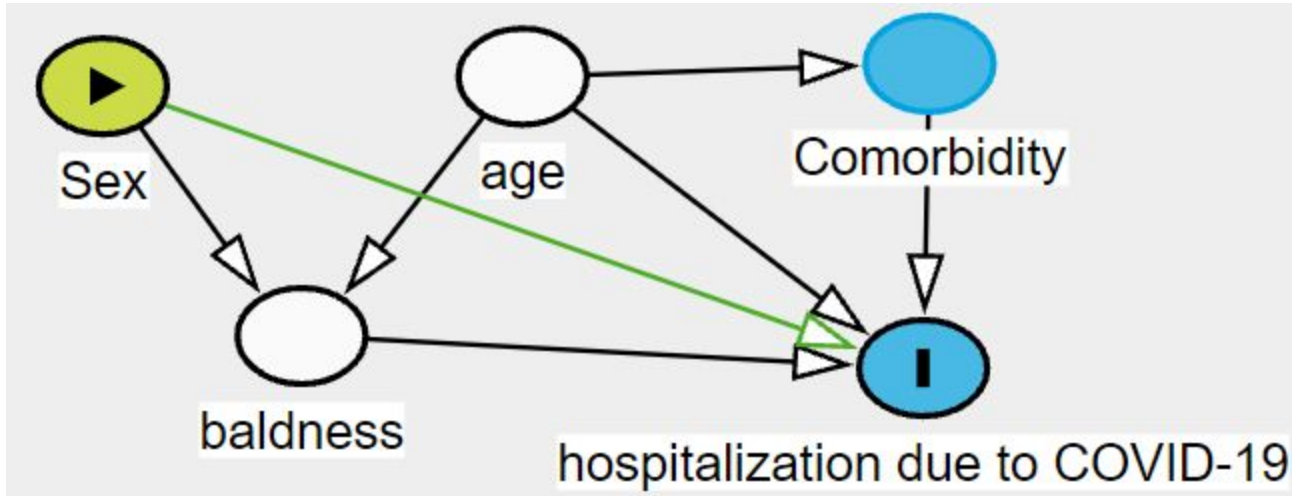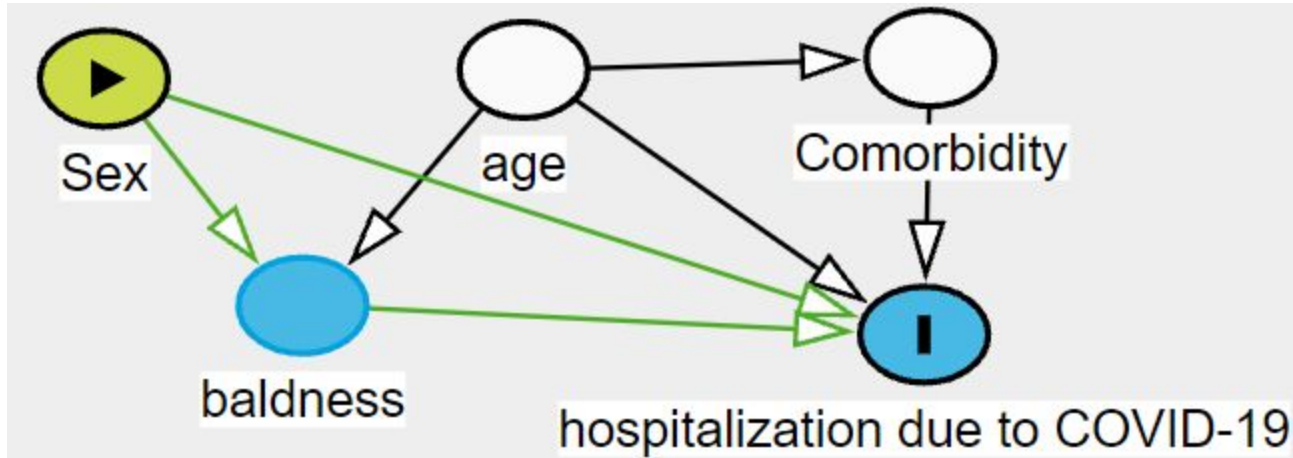
A potential DAG when Sex is exposure

Minimal sufficient adjustment sets containing age for estimating the total effect of Sex on hospitalization due to COVID-19: Comorbidity, age.

Table 2 fallacy Example (mutually adjustment)

- Let's assume baldness is the ==exposure variable==.
- Age and sex belong to ==minimal adjustment== variables.
- Age, sex, comorbidity could be ==another adjustment set==.
- There can be many adjustment sets.

"fallacy is the belief that all coefficients have a similar interpretation"
http://dagitty.net/learn/graphs/table2-fallacy.html

Table 2: Adjusted associations between baldness and hospitalization due to Covid-19 from [insert data/location, and data collection year].

Exposure and covariates	Adjusted OR [1] (95% CI)
Baldness (Yes vs. No)	1.20 (0.08-2.90)
Age (Older vs. Younger) [2]	2.00 (1.85-4.90)
Sex (Male vs. Not)	1.12 (0.85-2.90)

CI: confidence interval; OR: odds ratio.

[1] The adjusted analysis was done via a design-based binary logistic regression analysis, adjusted for age and sex.

[2] Age was categorized as older when age was greater than or equal to 50.

- Individuals with baldness are 1.2 times more likely to be hospitalized due to covid-19.
- Older adults are 2 times more likely to be hospitalized due to covid-19.
- Male adults are 1.12 times more likely to be hospitalized due to covid-19.

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Avoiding Table 2 fallacies

'Table 2 problems can be avoided by

- <u>limiting the table to estimates of the primary exposure effect measures</u> under the different models, with
- the secondary "<u>adjustment</u>" <u>covariates reported in a footnote</u>
- along with how they were <u>categorized or modeled</u>,

as is common practice in space-limited presentations.'

Avoiding Table 2 fallacies: Decide exposure 1

Table 2: Adjusted associations between baldness and hospitalization due to Covid-19 from [insert data/location, and data collection year].

Exposure variable of primary interest	Adjusted OR [1] (95% CI)
Baldness (Yes vs. No)	0.32 (0.08-2.90)

CI: confidence interval; OR: odds ratio.

[1] The adjusted analysis was done via a design-based binary logistic regression analysis, adjusted for age and sex.

Be clear to yourself: <u>why are you adjusting anything</u>?

Goal of adjustment:
Removing backdoor paths

Avoiding Table 2 fallacies: Decide exposure 2

Table 2: Adjusted associations between age and hospitalization due to Covid-19 from [insert data/location, and data collection year].
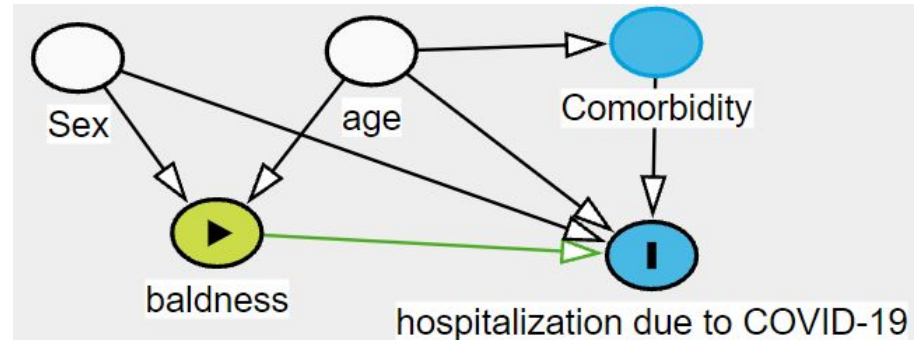
Exposure variable of primary interest	Adjusted OR [1] (95% CI)
Age (Older vs. Younger) [2]	3.22 (1.85-4.90)

CI: confidence interval; OR: odds ratio.

[1] The adjusted analysis was done via a design-based binary logistic regression analysis, adjusted for sex.

[2] Age was categorized as older when age was greater than or equal to 50.

Goal of adjustment: adjusting for risk factor of the outcome / increase precision.

Avoiding Table 2 fallacies: Decide exposure 3

Table 2: Adjusted associations between sex and hospitalization due to Covid-19 from [insert data/location, and data collection year].
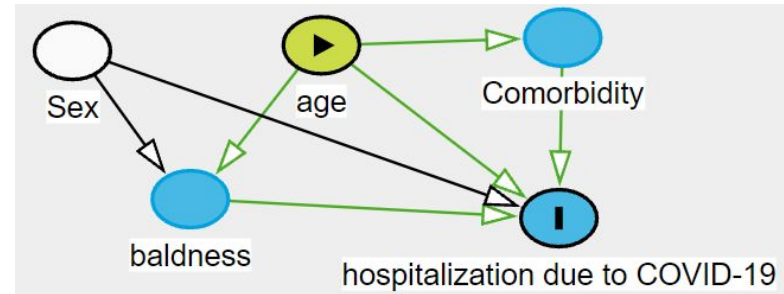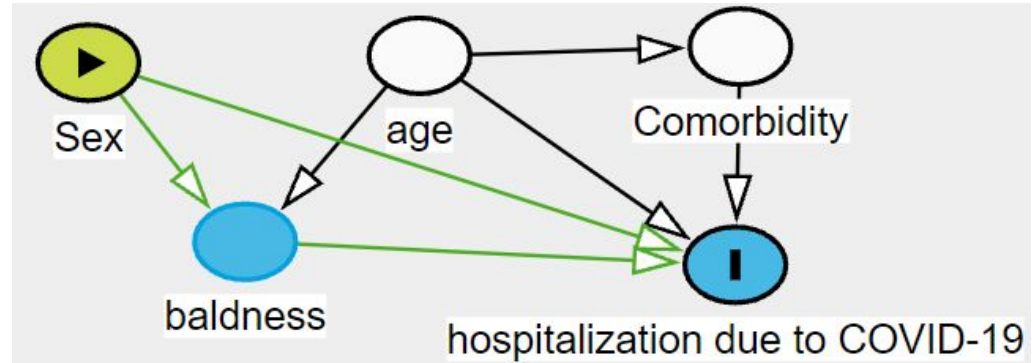
Exposure variable of primary interest	Adjusted OR [1] (95% CI)
Sex (Male vs. Not)	2.12 (0.85-2.90)

CI: confidence interval; OR: odds ratio.

[1] The adjusted analysis was done via a design-based binary logistic regression analysis, adjusted for age and comorbidity.

Goal of adjustment: adjusting for risk factor of the outcome / increase precision.

Thanks!

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