Diabetes and Cancer

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Gentofte, Denmark
http://BendixCarstensen.com

3rd Update: Diabetes and Cardiovascular Disease

http://BendixCarstensen.com/3rdUpdate

Roma, April 2012

Diabetes and Cancer

Two main questions:

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  — cancer **incidence** studies
- Do cancer patients with diabetes die earlier than cancer patients without diabetes?
  — cancer **survival** studies
- Combination (ignoring the cancer diagnosis):
  Do diabetes patients die more frequently from cancer than non-diabetics?
  — cancer **mortality** studies

Diabetes and Cancer problems

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So, no trials exist or will be done

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- There is no remedy for this
- What I show is therefore a **description** of cancer occurrence in (various groups of) diabetes patients.
- Causal interpretations are purely speculation.

Cancer mortality & treatment

Bowker *et al.* [1] found for cancer mortality:

	Patients	Deaths	RR	95% c.i.
Oral antidiabetica:				
Metformin	6,969	245	1.0	(ref)
Sulfonylurea	3,340	162	1.3	(1.1–1.6)
Insulin use:				
No insulin use	8,866	323	1.0	(ref)
Insulin use	1,443	84	1.9	(1.5–2.4)

This general pattern is repeatedly reported since then.

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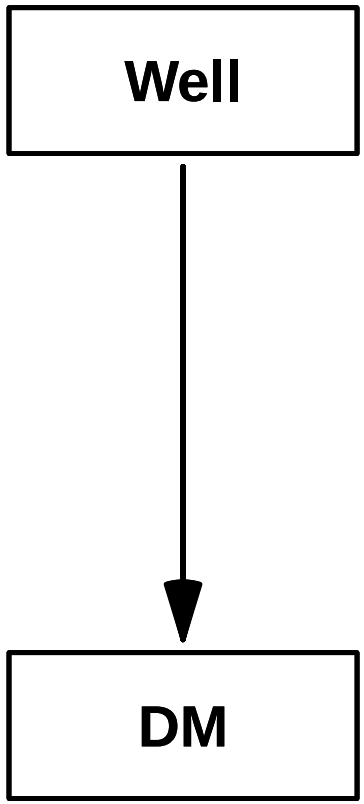
There is biological reason to suspect insulin/analogs for a role in cancer promotion.
But evidence is weak and data are limited.

Graphical overview



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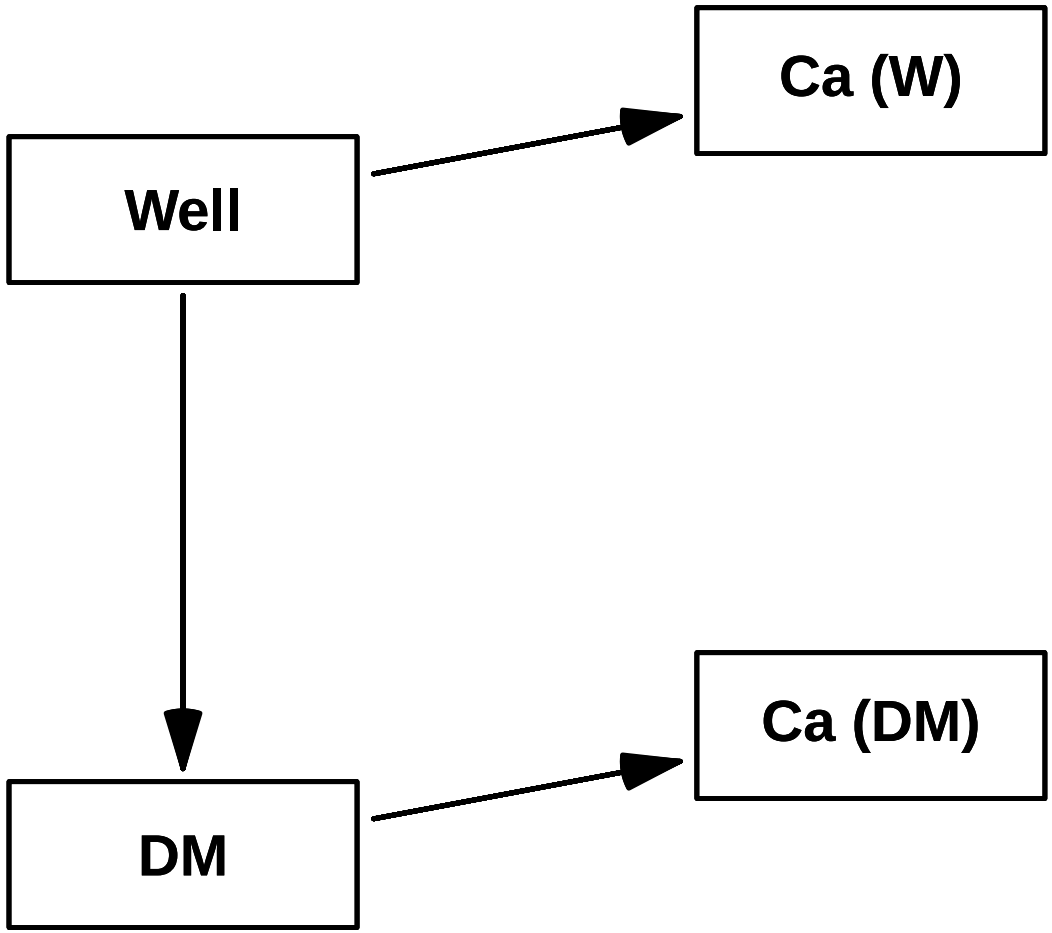

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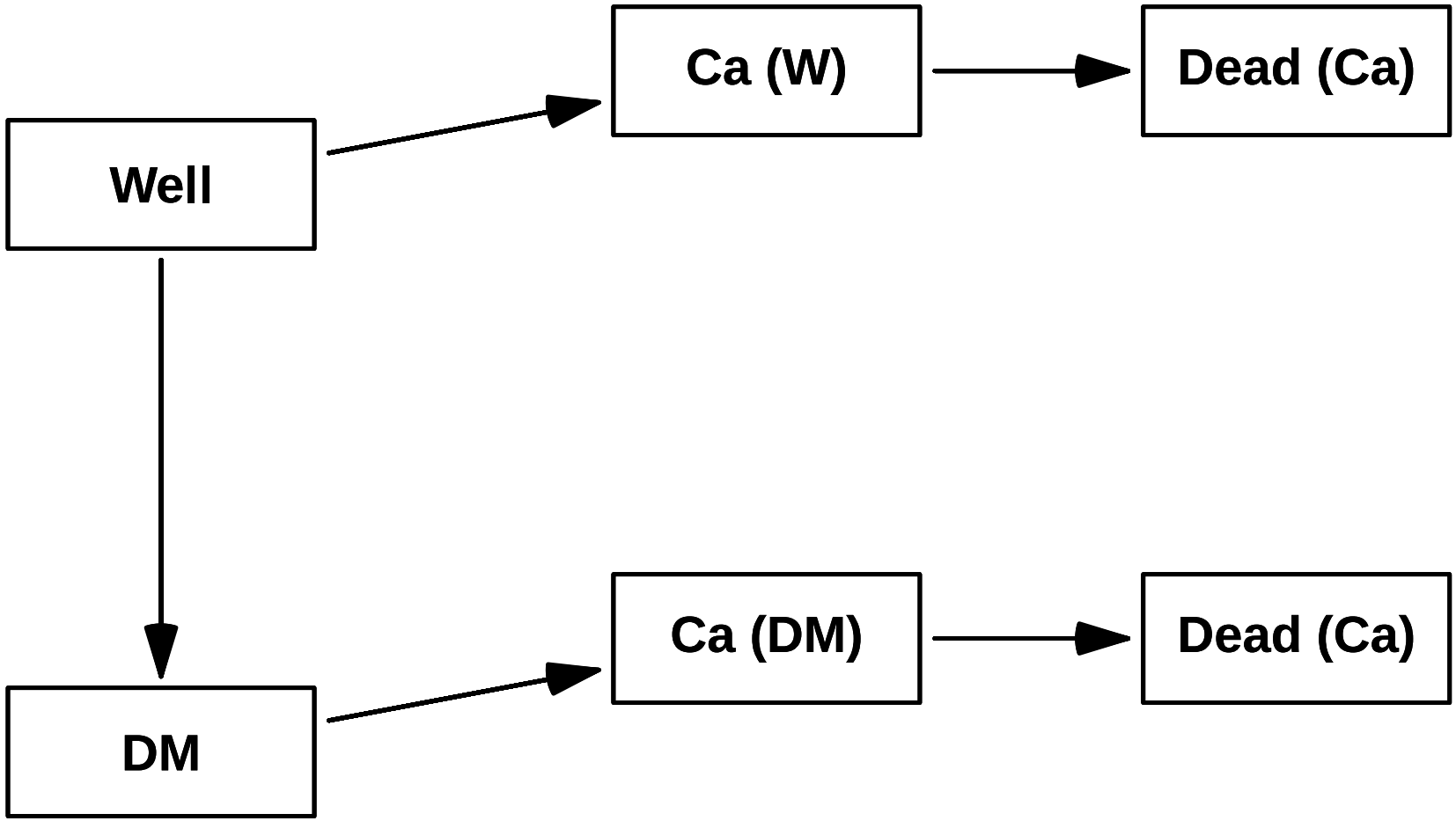

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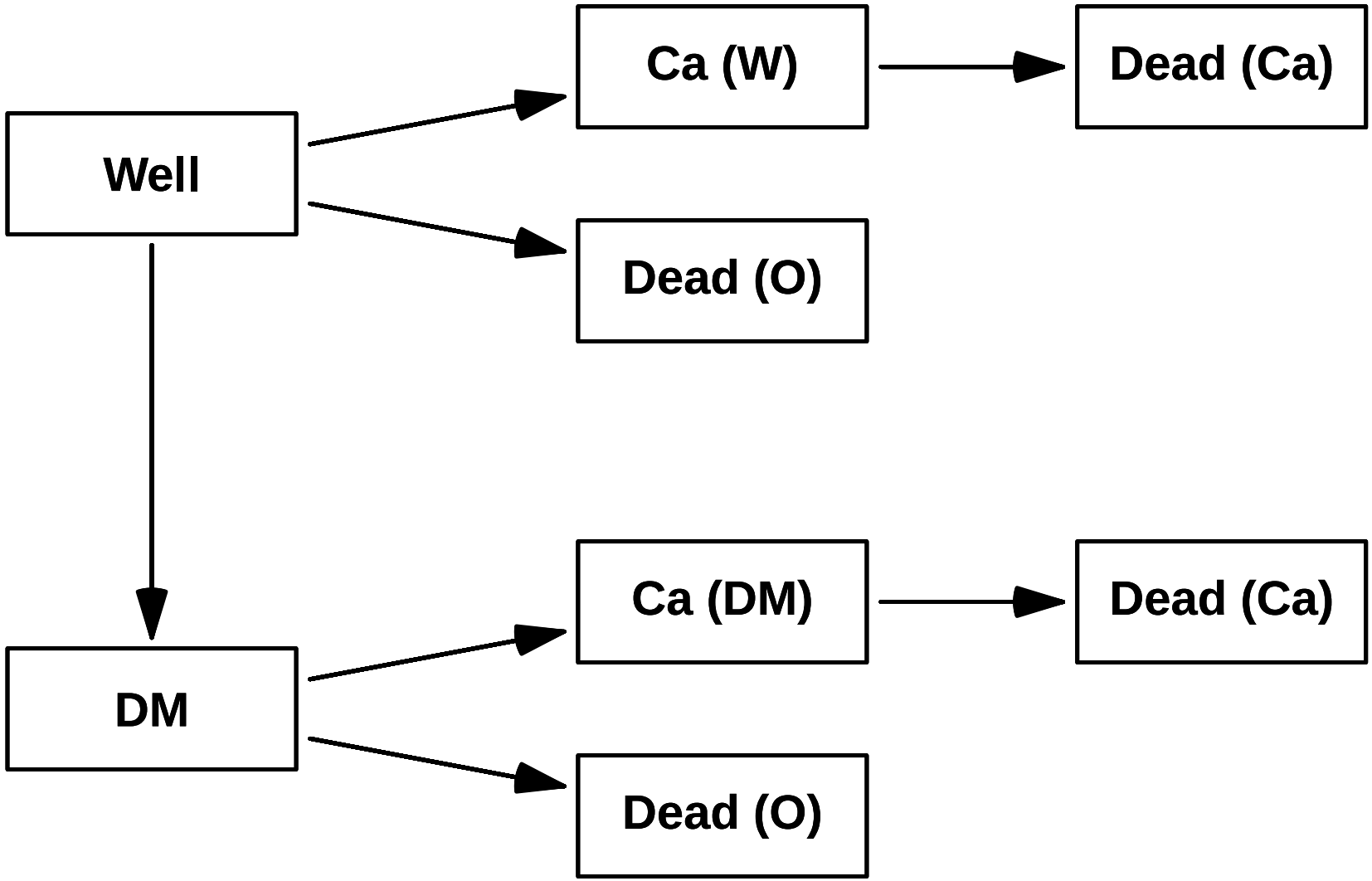
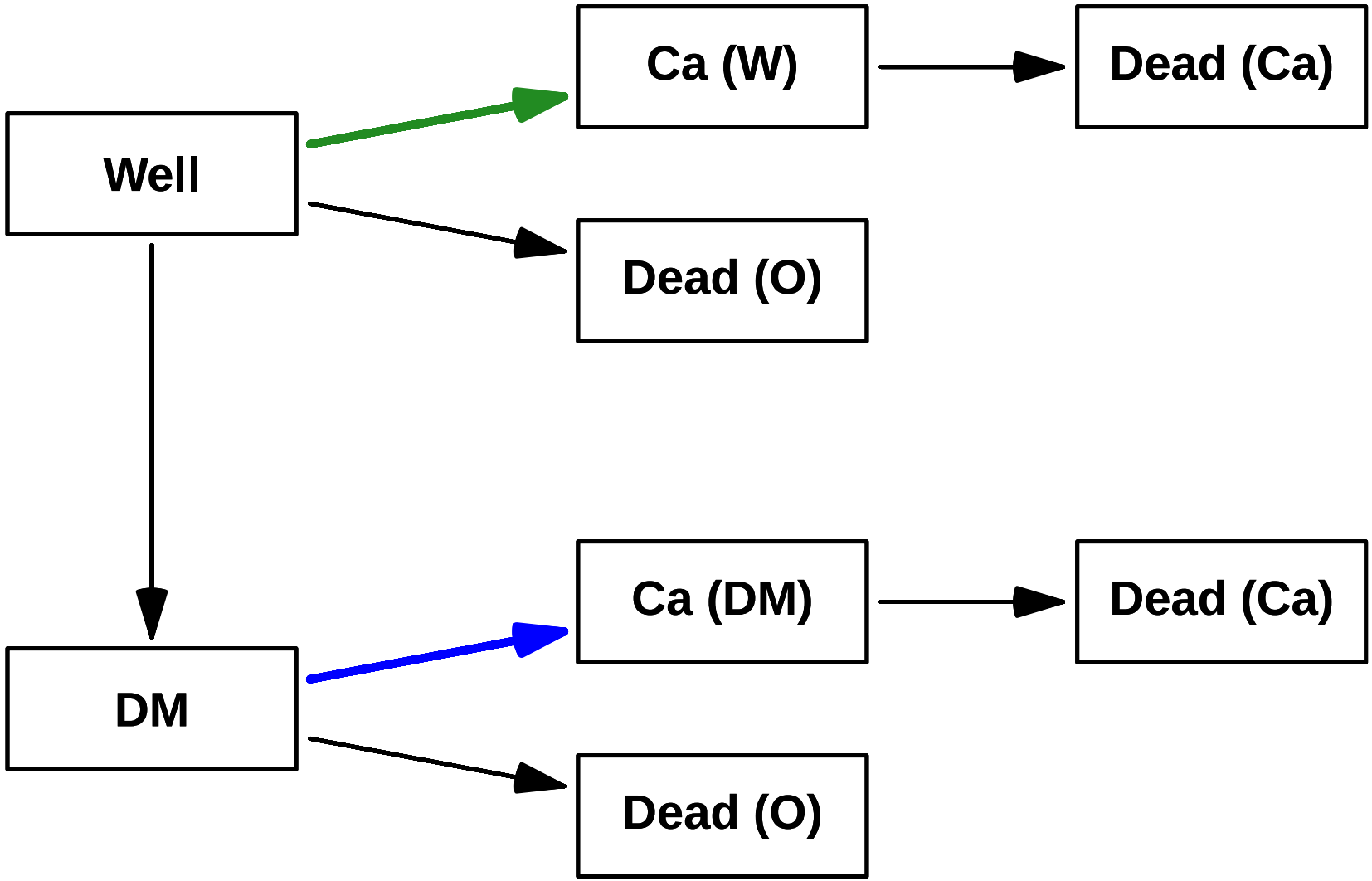
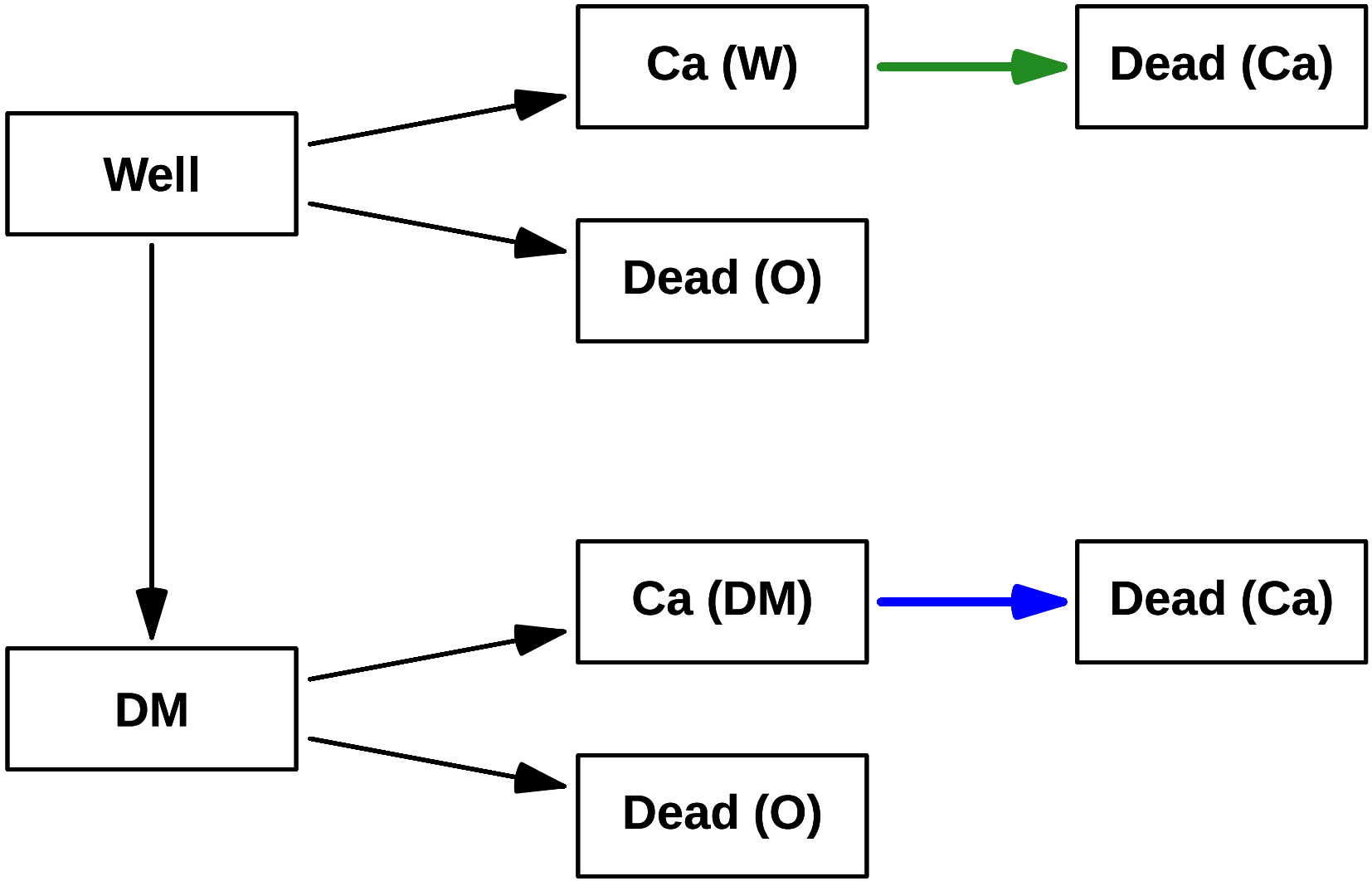


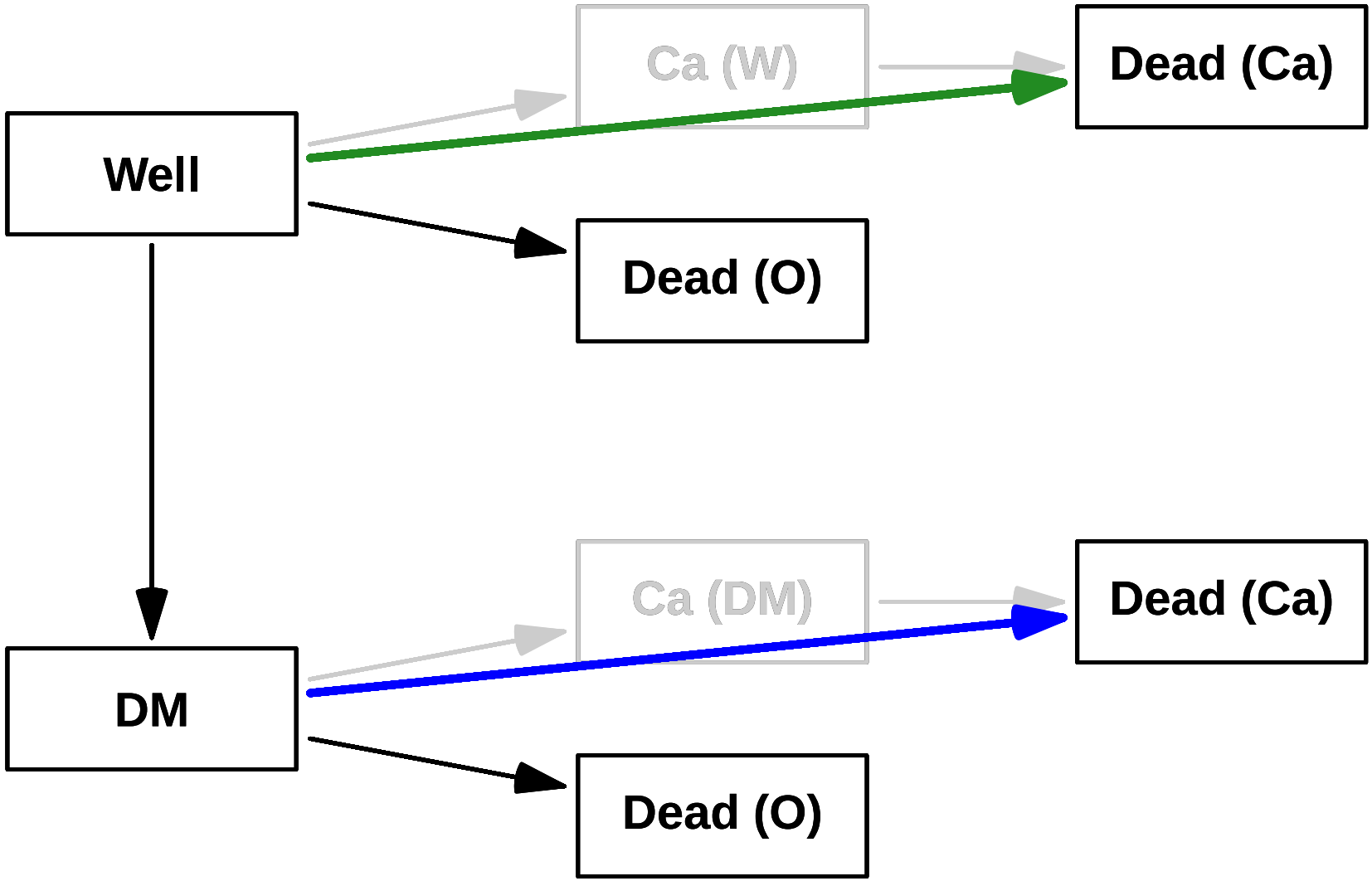
Cancer incidence



Cancer survival



Cancer mortality



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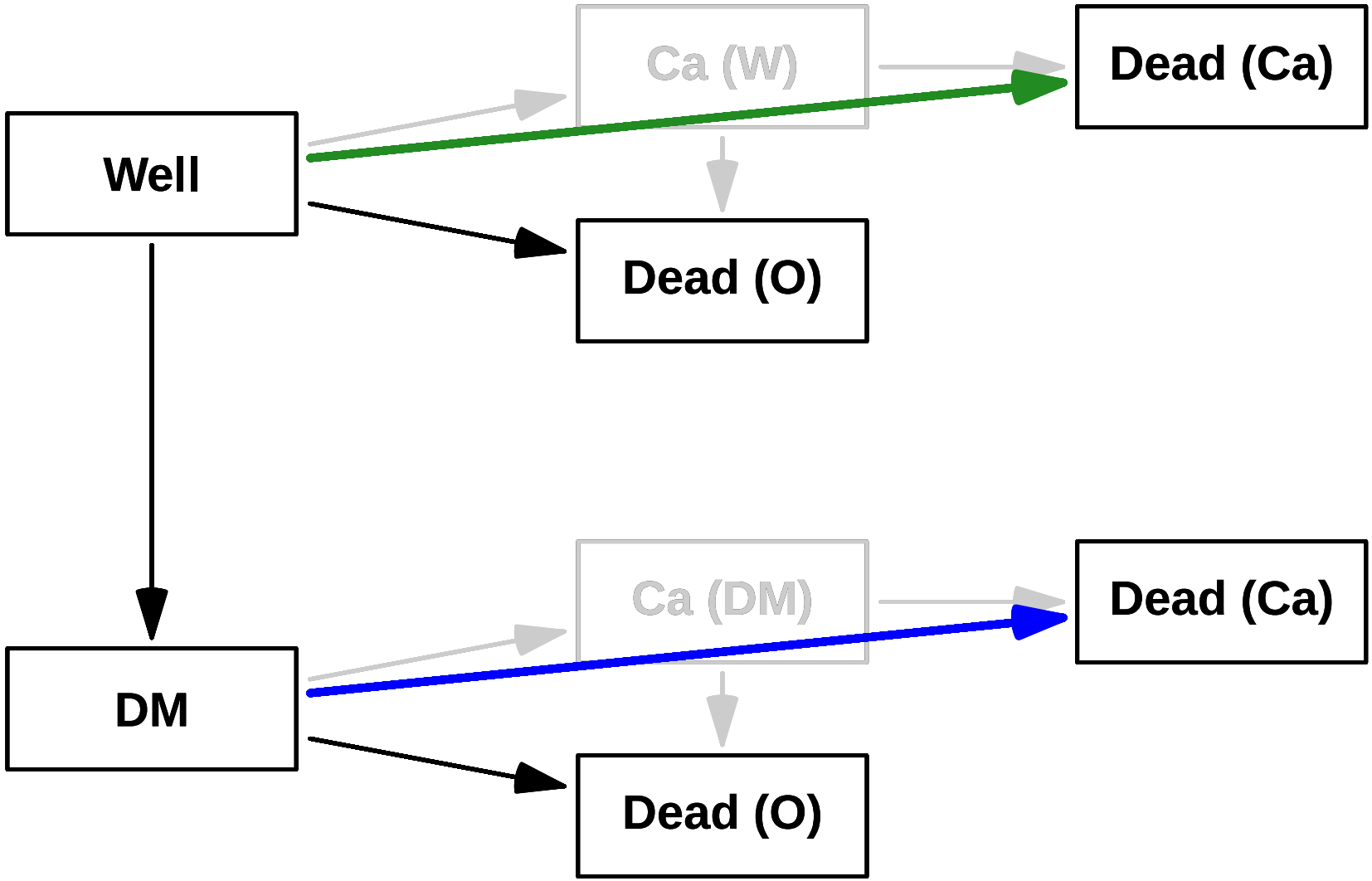

The Danish study

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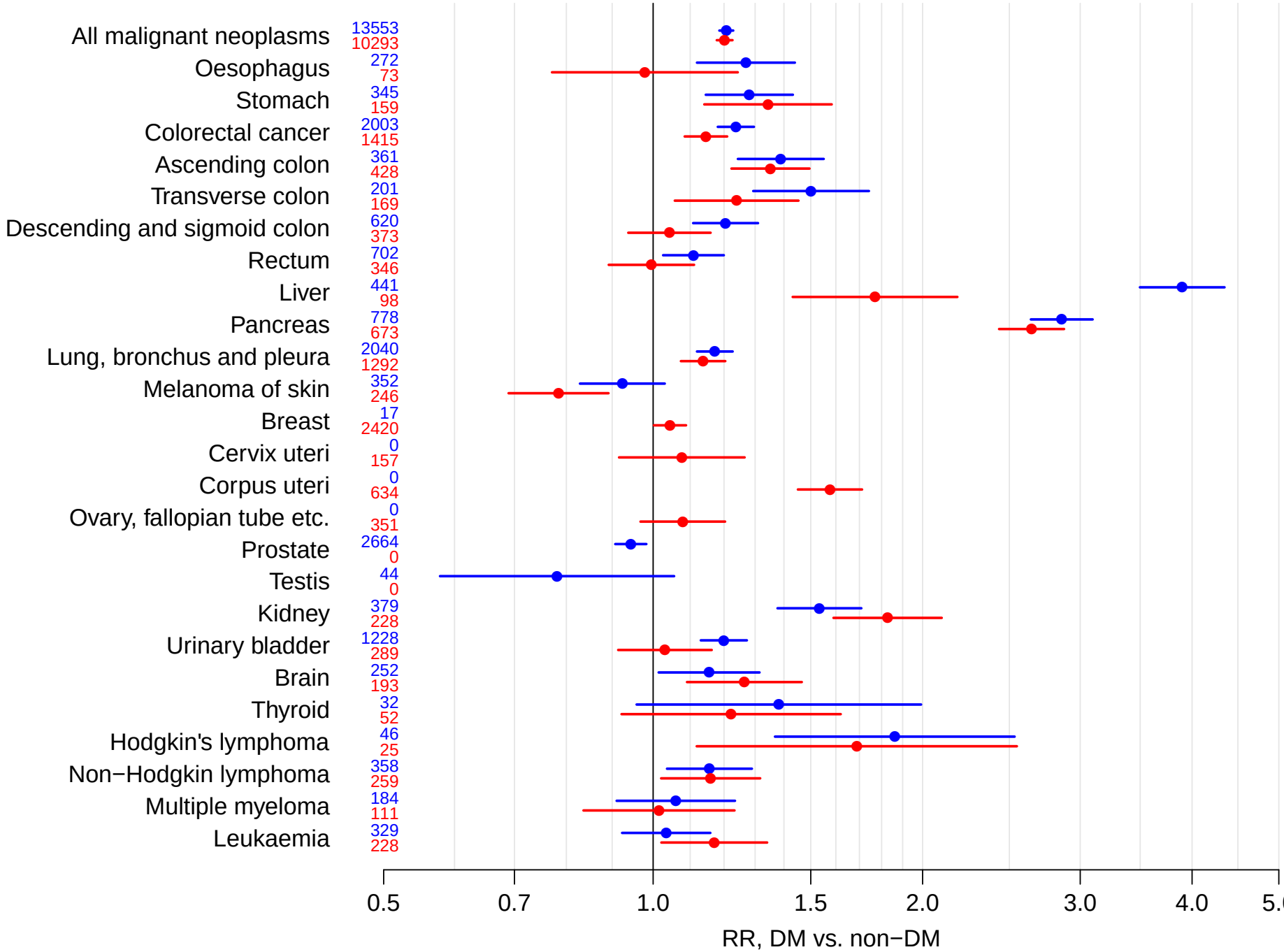
- Results broadly confirm previous findings [7, 8]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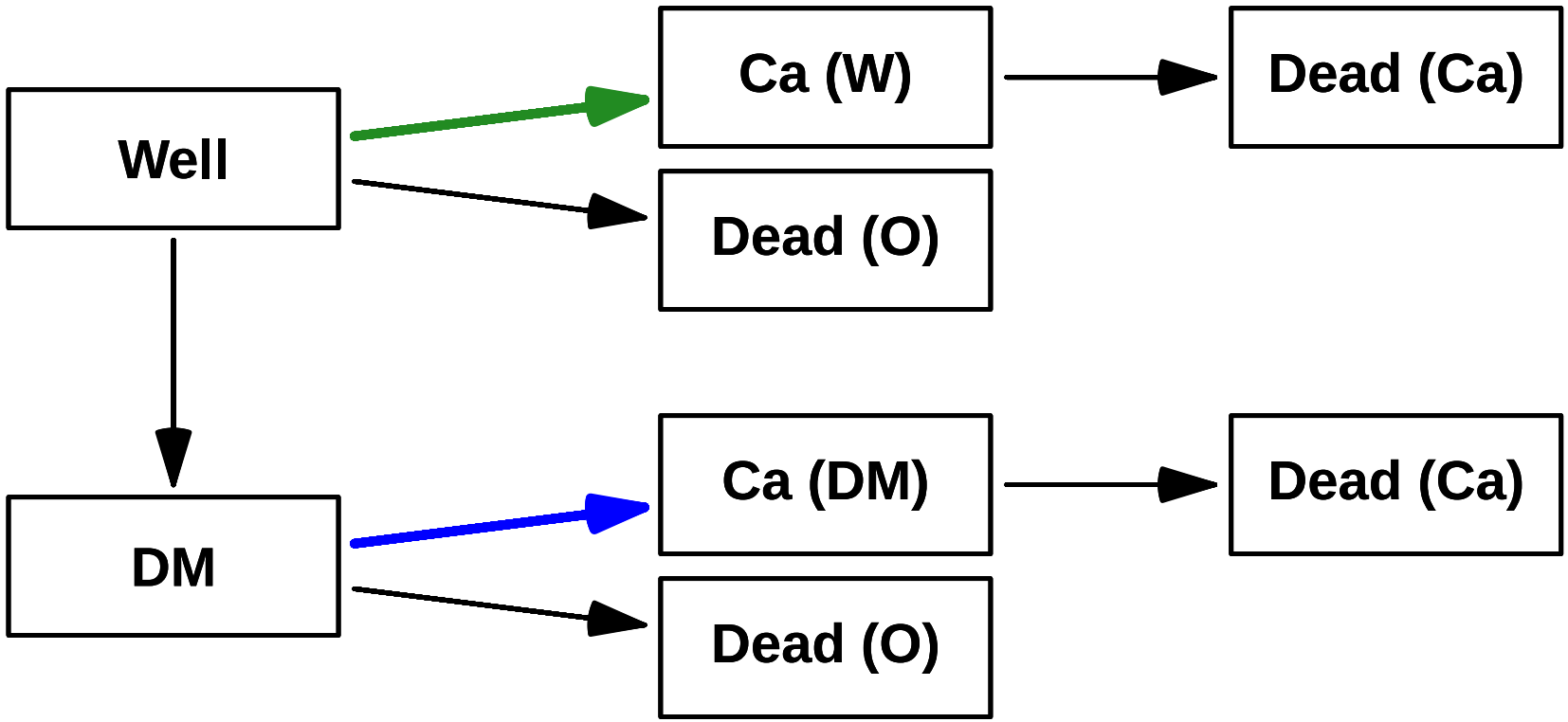

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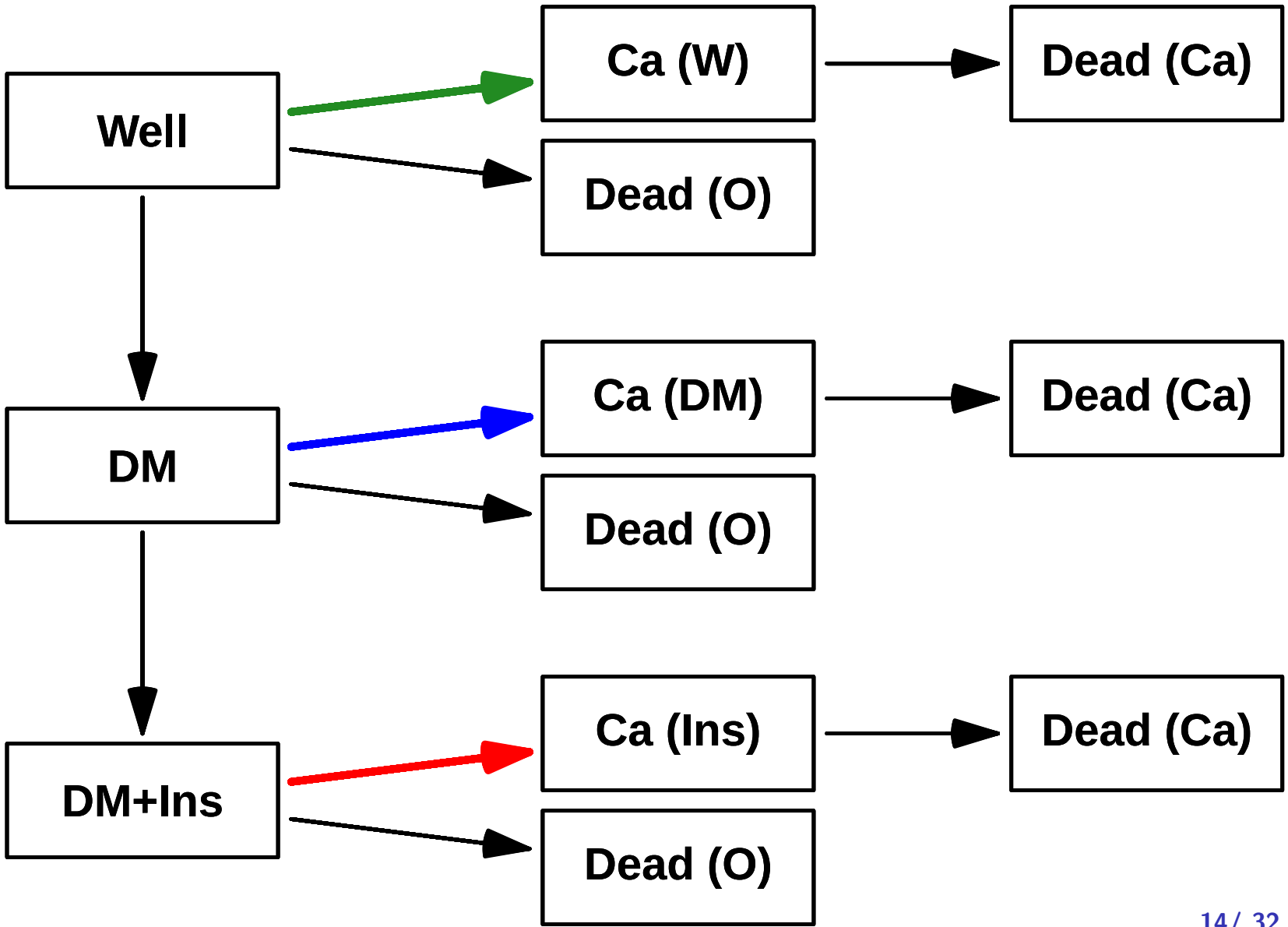

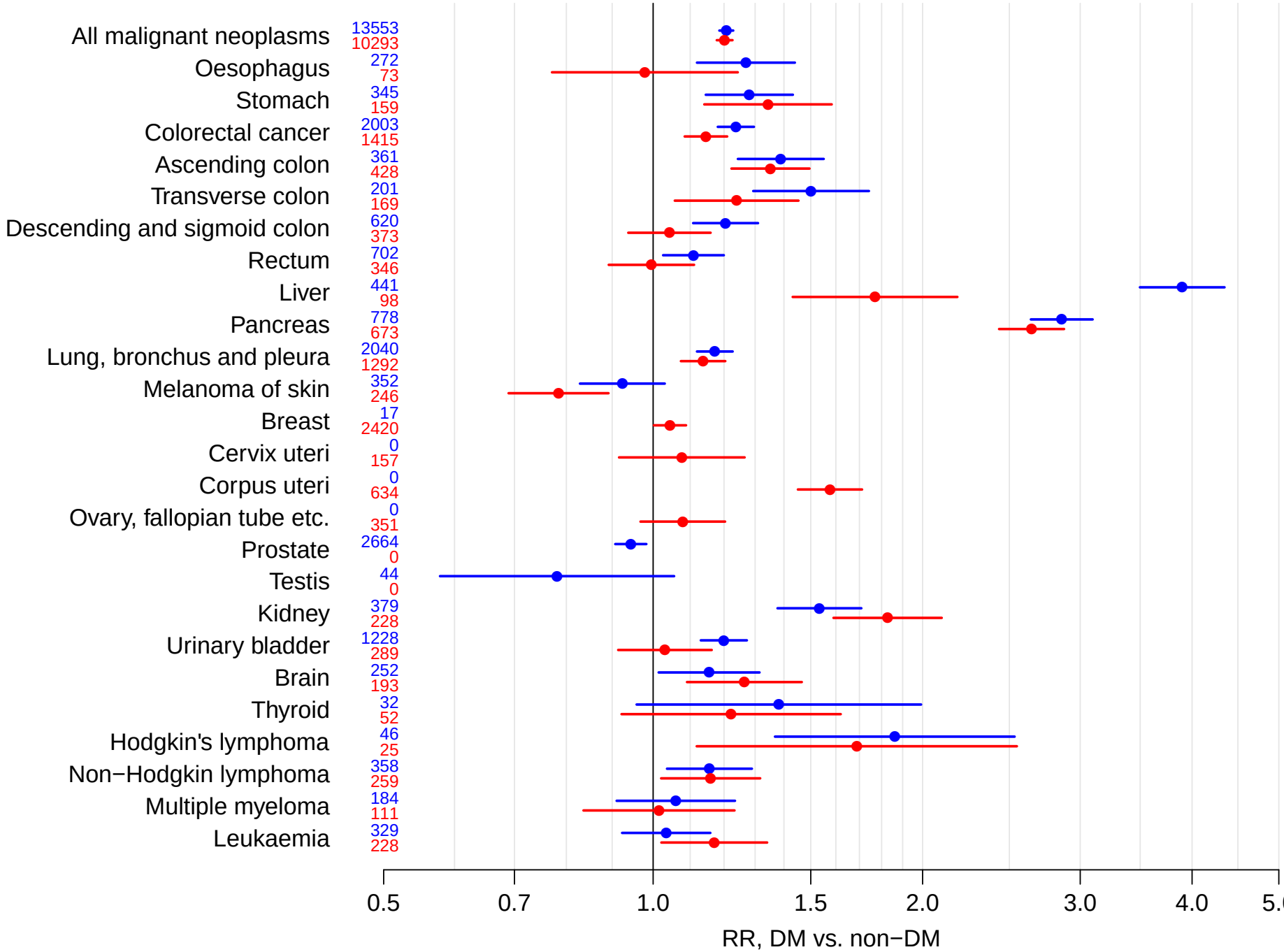
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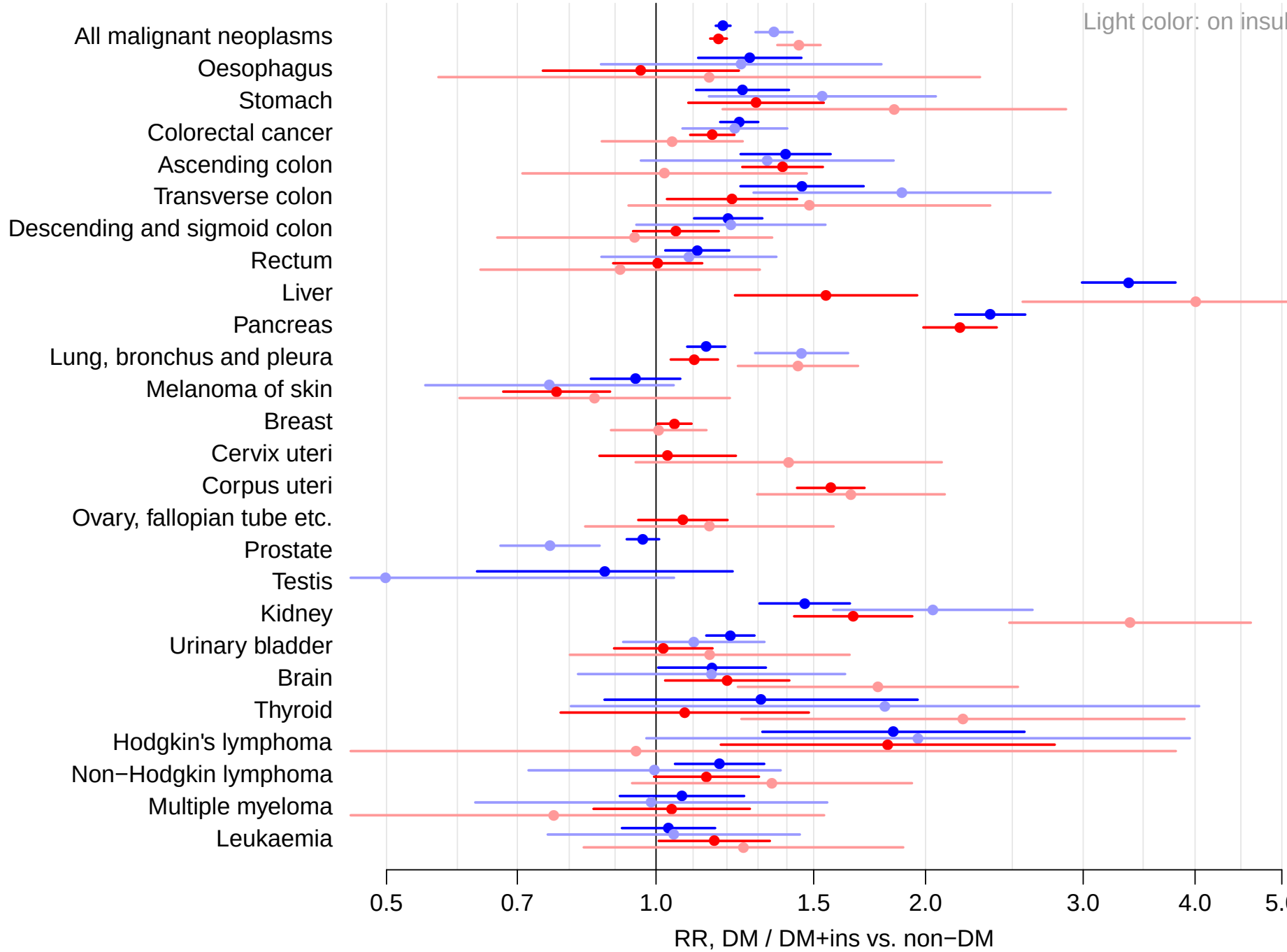
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  - Insulin user long term RR: 1.3

Questions on incidence

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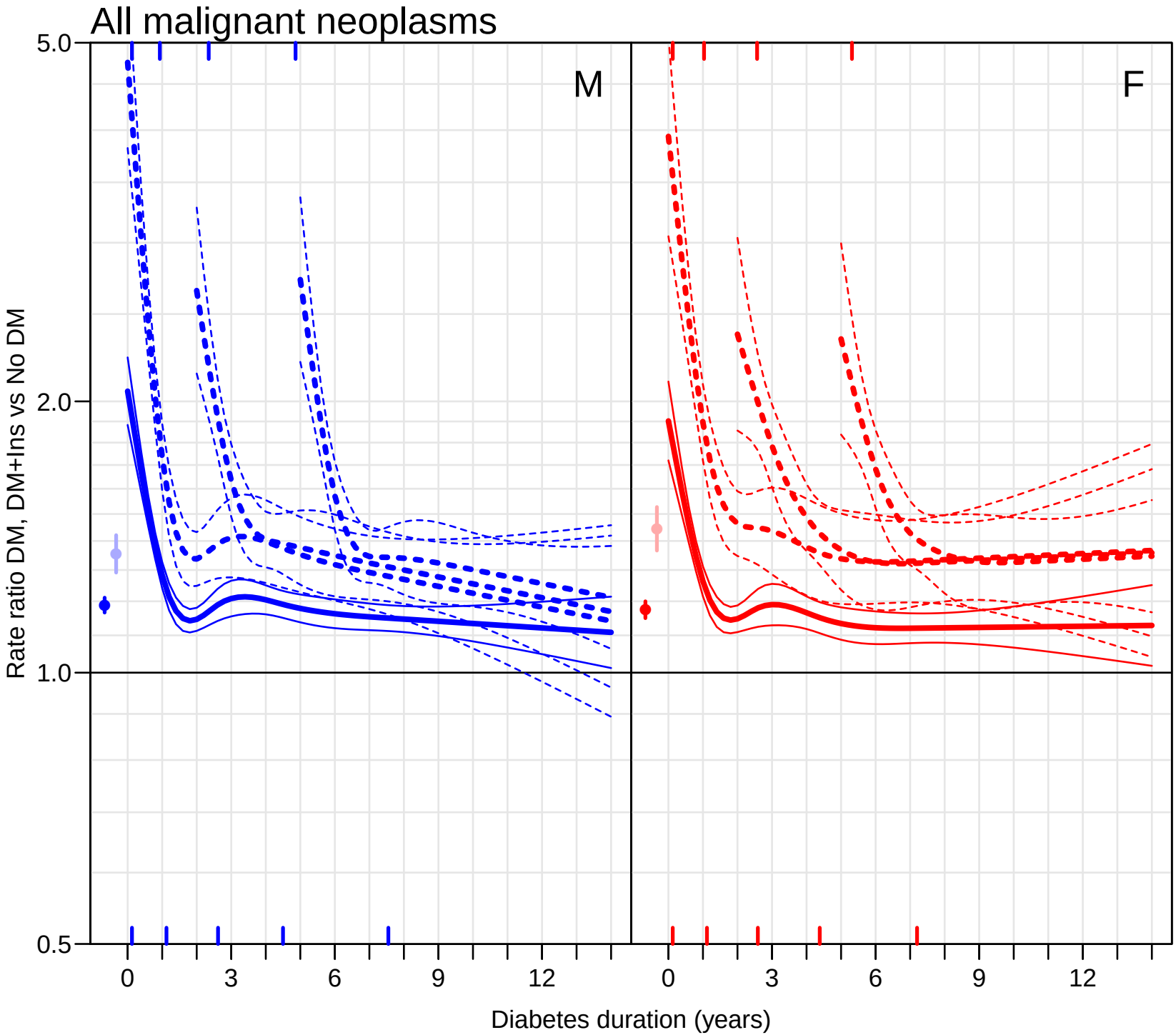
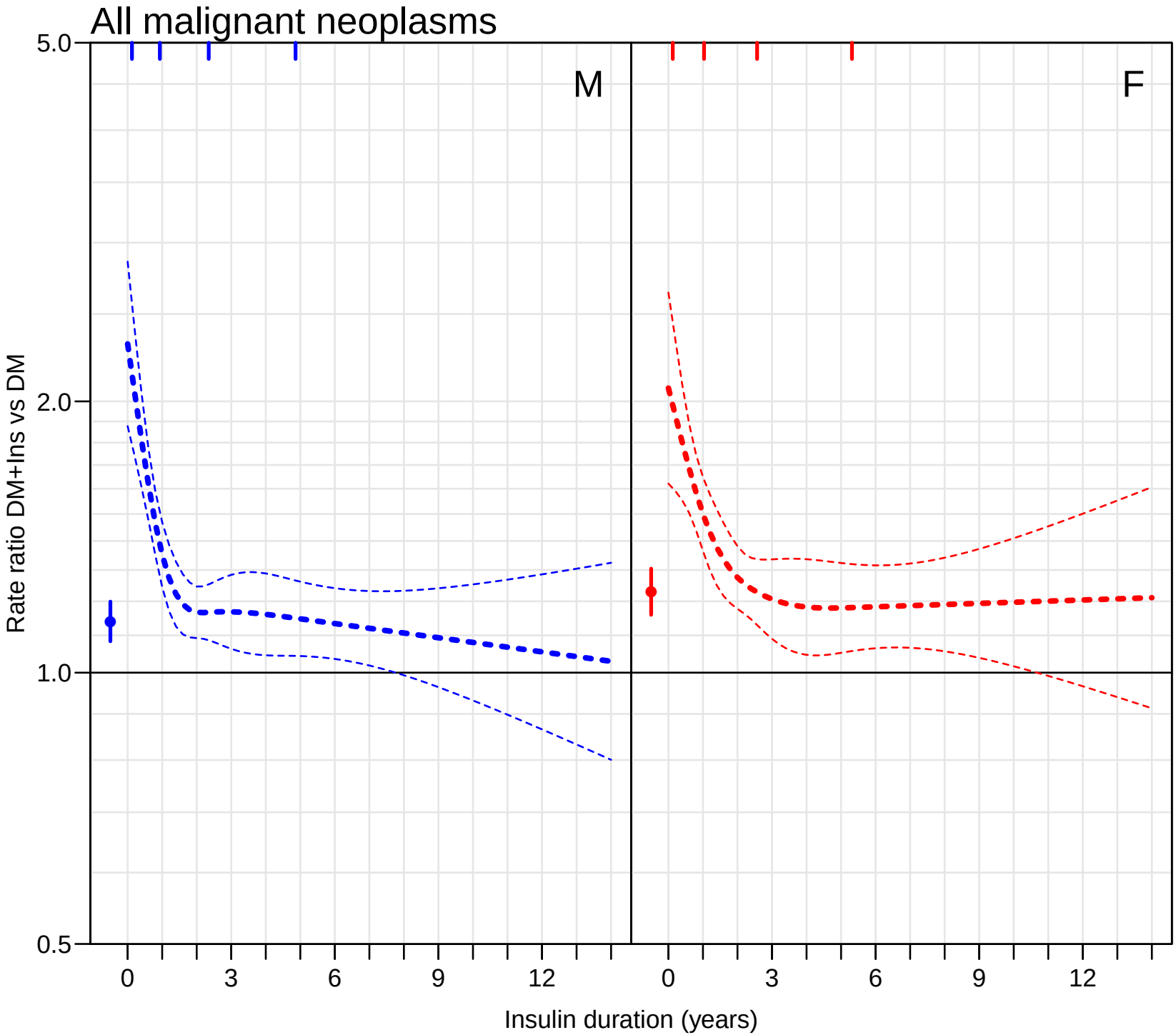
- Does cancer incidence vary with duration of insulin use?
- What is the cumulative **risk** of cancer?


All malignant neoplasms
M
F
5.0
2.0
1.0
0.5
Rate ratio DM, DM+Ins vs No DM
0
3
6
9
12
Diabetes duration (years)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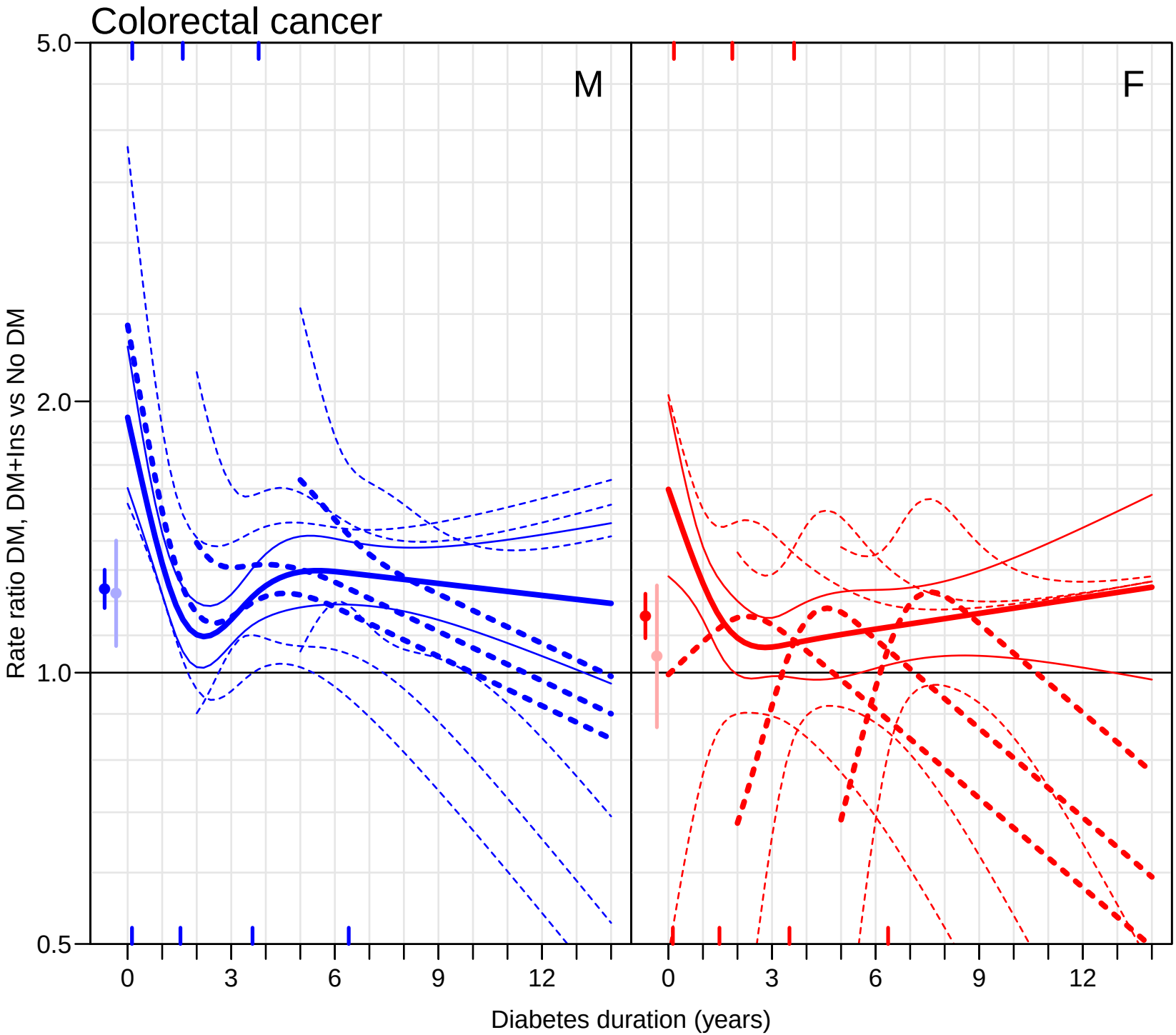
Insulin duration (years)


Colorectal cancer
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5.0
2.0
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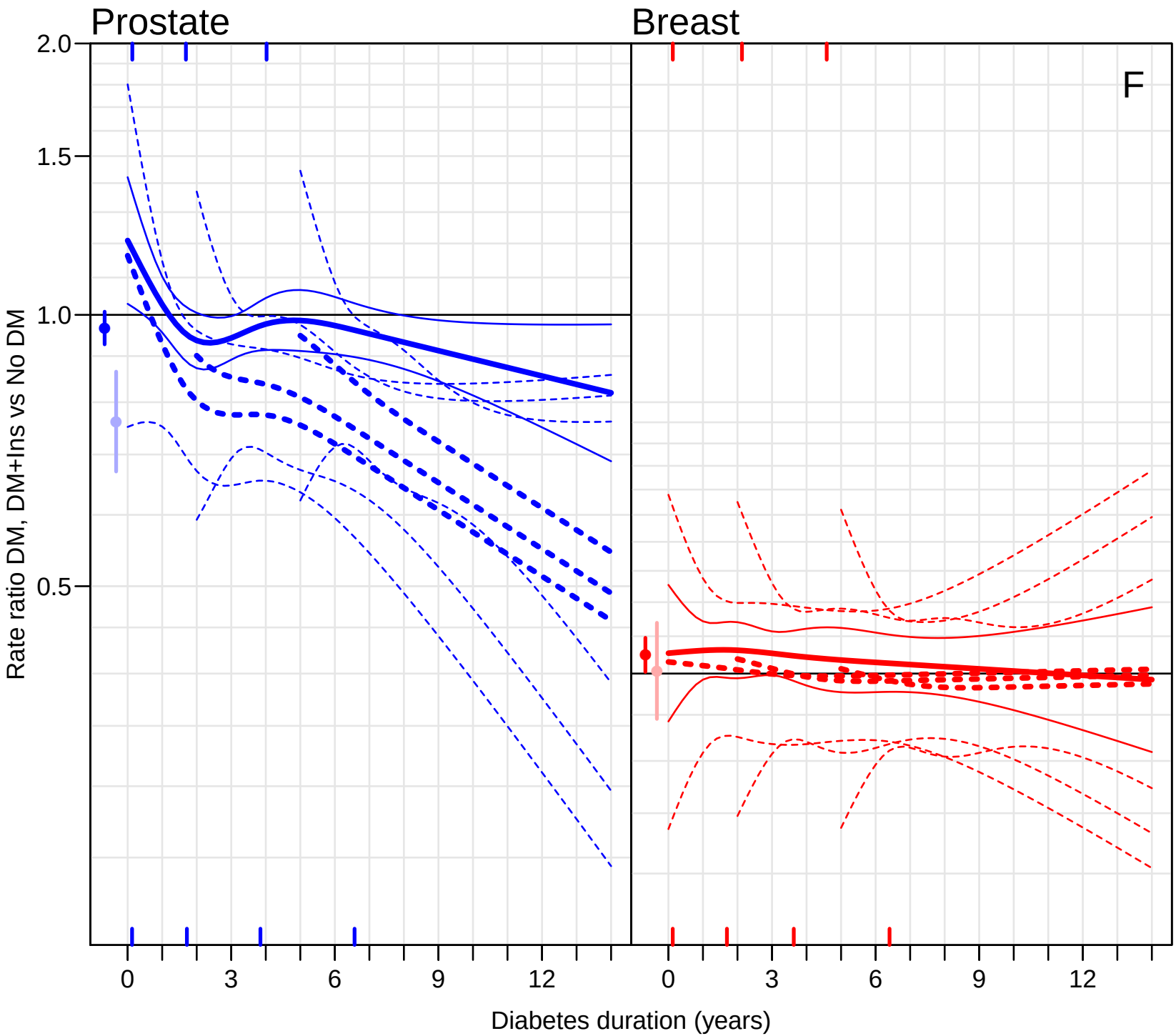
Prostate
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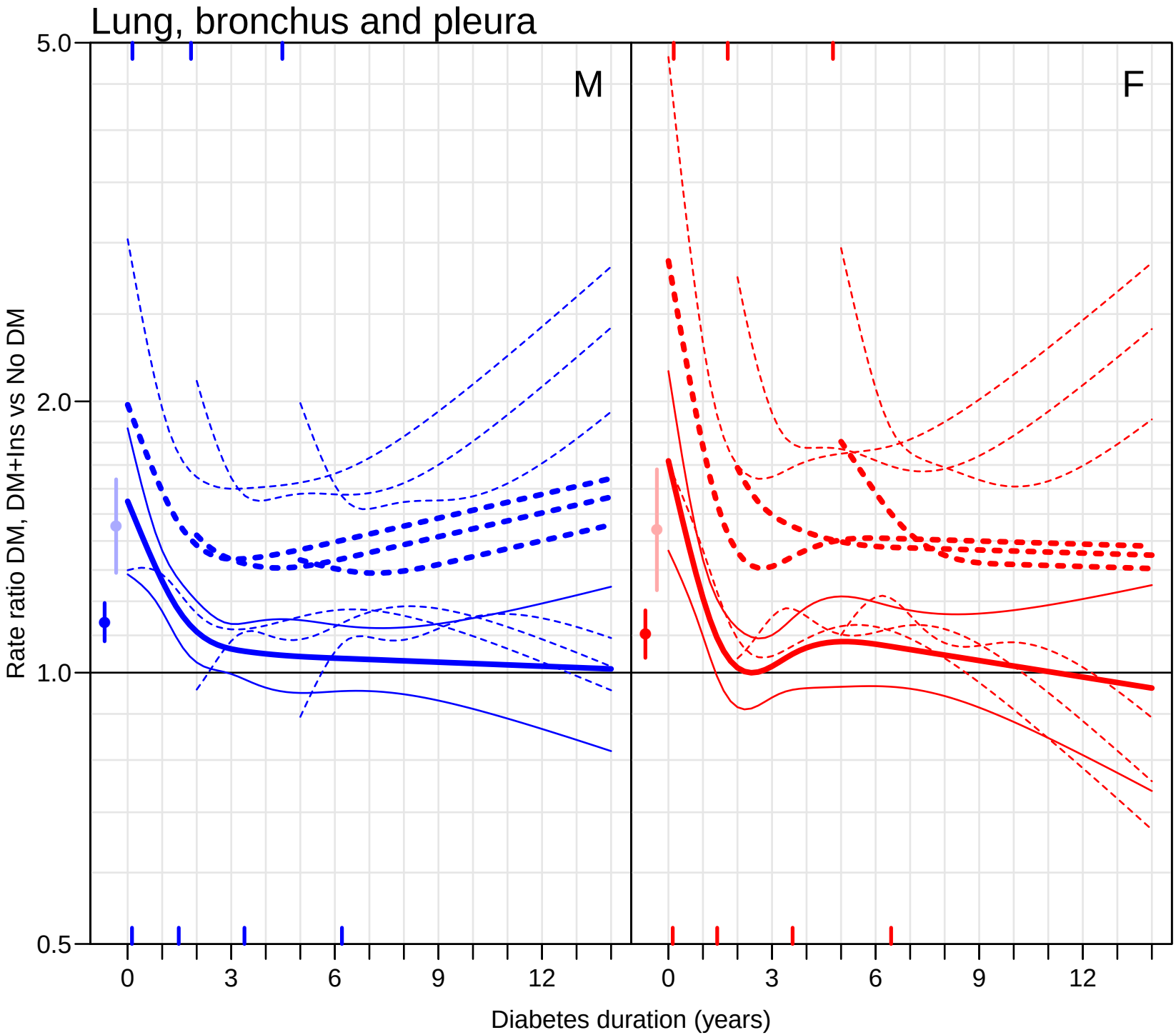
Lung, bronchus and pleura
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Diabetes duration (years)

Cumulative risk of cancer

This is asking the question(s):

- What fraction of patients will have a cancer diagnosis within the next X years?

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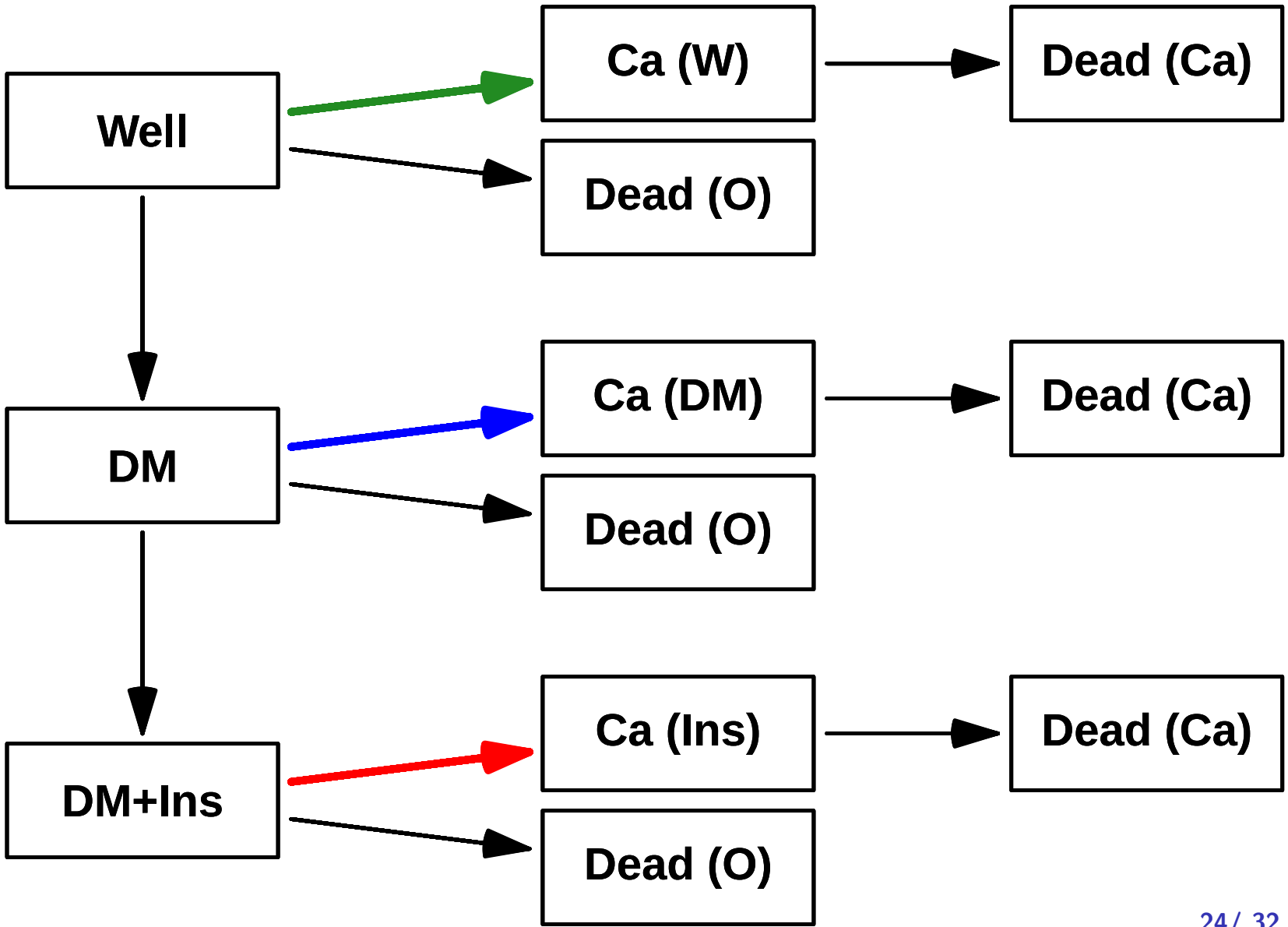
- NOTE: this also involves the mortality rates!

Cumulative risk of cancer



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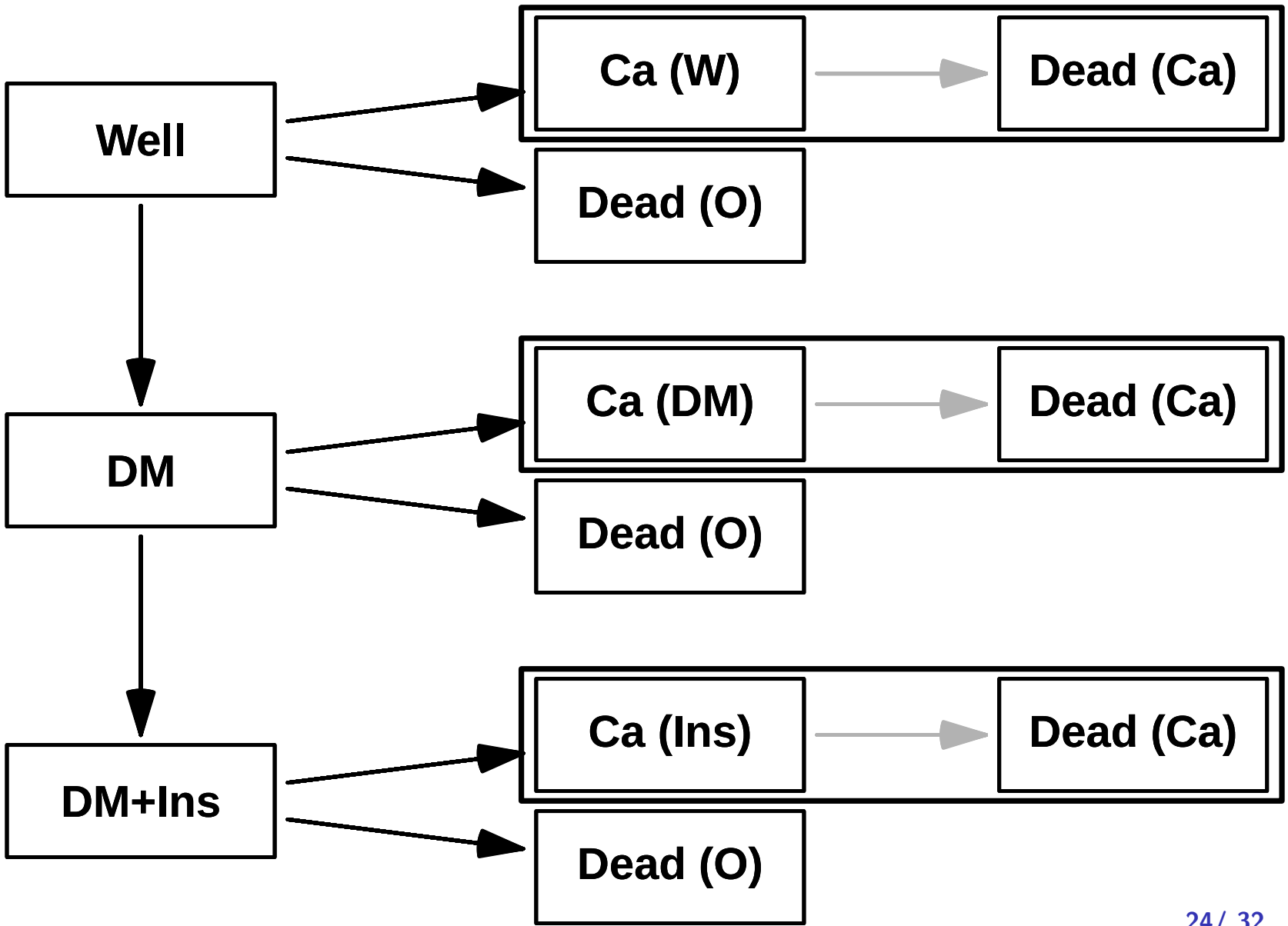

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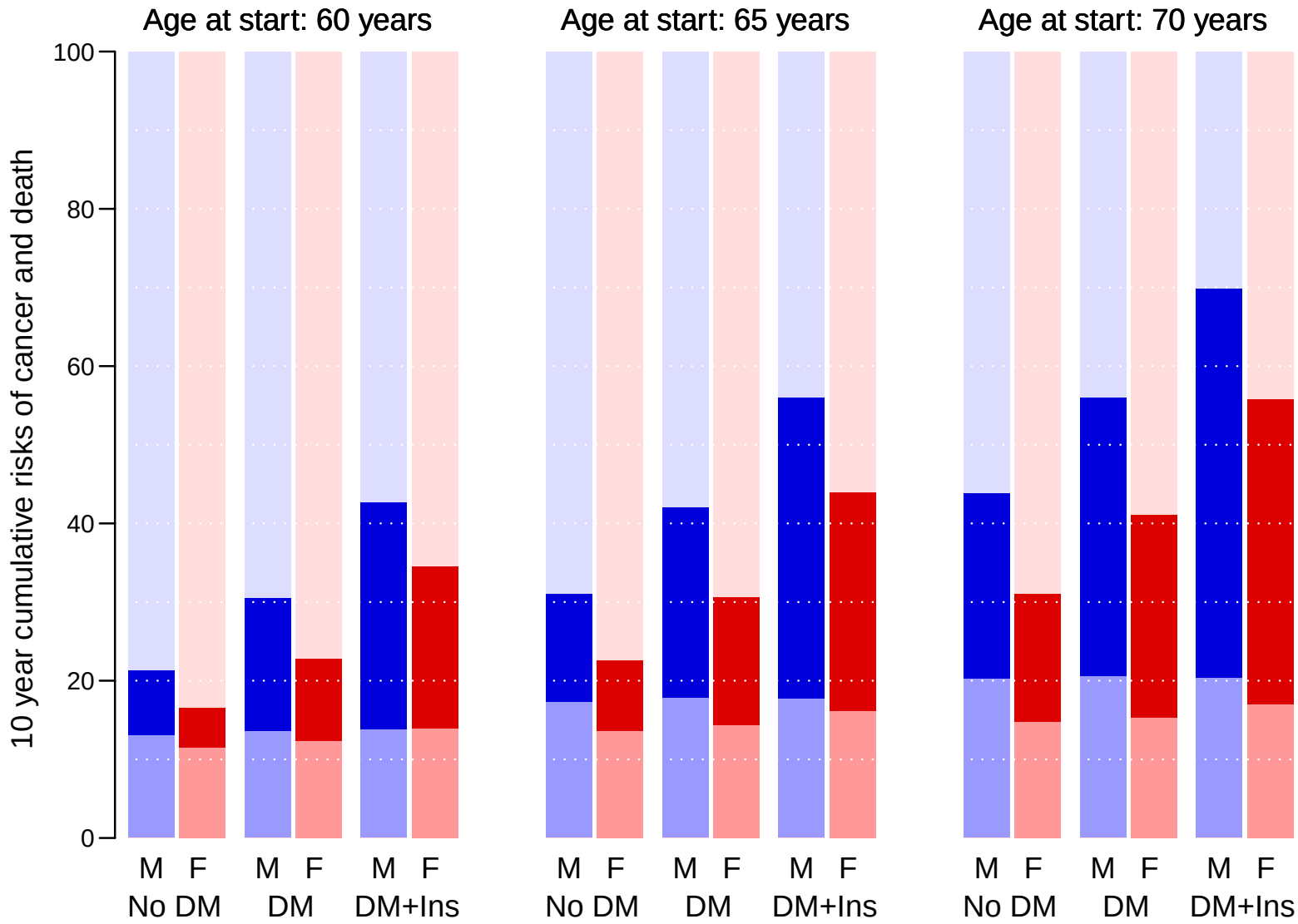

Conclusion

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7. Smaller incidence rates for prostate, more so by time.

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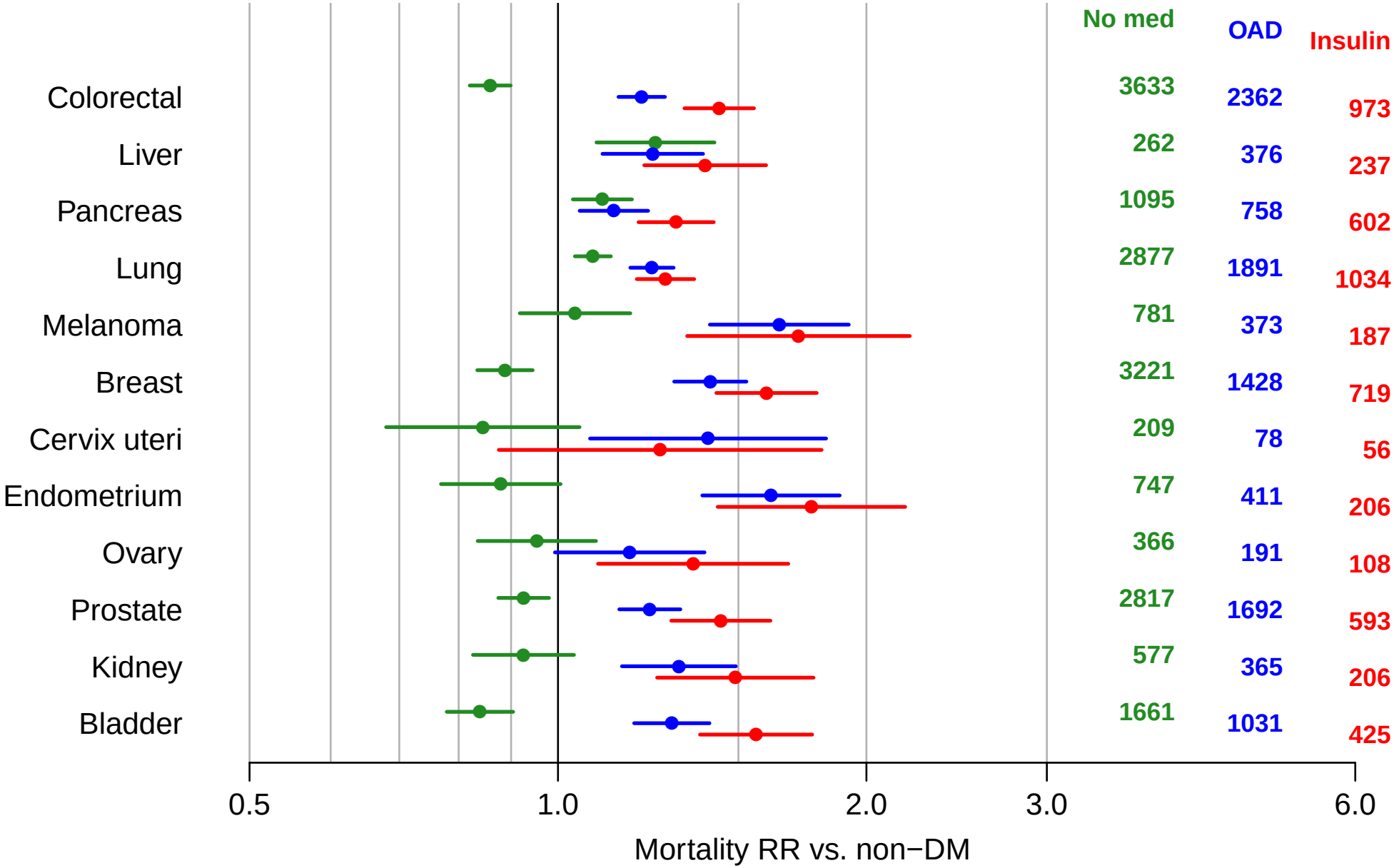
Mortality of (all) Danish cancer ptt:



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    - Metformin: Inhibition of tumour growth
    - Insulin: Promotion of tumour growth

Conclusion

- Diabetes patients have overall 20% higher rates of cancer
- Varies dramatically by duration — highest in the beginning
- Long-term excess is 10% for ptt. not on insulin
- Long-term excess is 30% for ptt. on insulin
- Overall analyses suggest that patients on Metformin relative to SU have lower:
  - Cancer rates
  - Mortality rates

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