

# Glyphosate and AMPA exposure in relation to markers of biological aging in an adult population-based study

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## BACKGROUND

**Glyphosate** is a broad-spectrum, non-selective **herbicide** used in agriculture worldwide<sup>1</sup>.

→ Microbial degradation to **aminomethylphosphonic acid (AMPA)**

↳ Higher toxicity compared with glyphosate

→ Persistent in environment

→ Human exposure through contaminated food and occupational use

Has been associated with different health disorders (e.g. cancer) as well as with increased oxidative stress

The association with **biomarkers of aging** (i.e. telomere length & mtDNA content) is poorly investigated.

## HIGHLIGHTS

A doubling of the urinary **AMPA** concentration is associated with a **2.95% longer telomere length**.

No association was observed with urinary glyphosate concentrations, nor any associations with mtDNA content.

## METHODS

Flemish Environment and Health Studies (2012 – 2016)

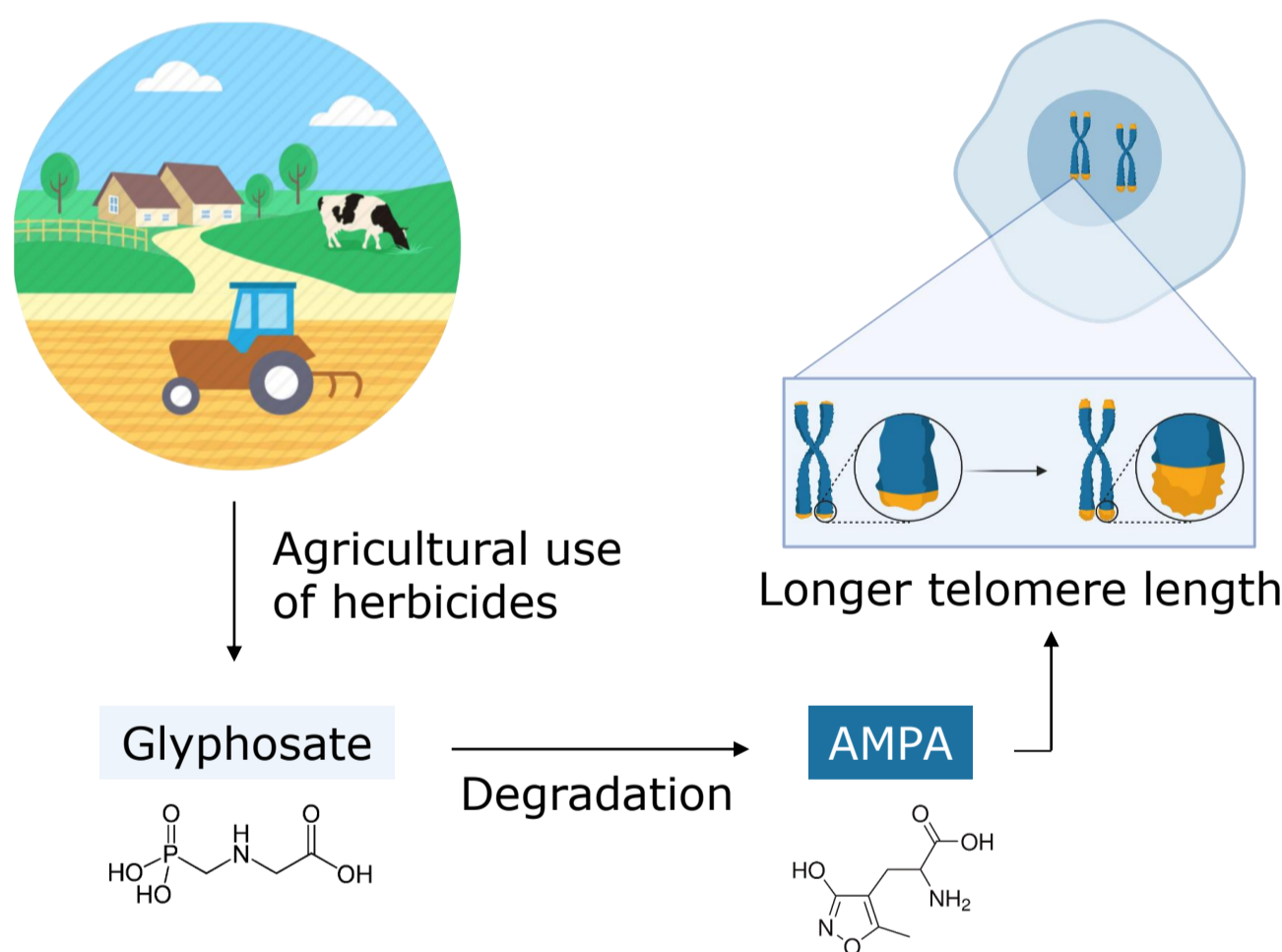
→ 181 adults aged 50 to 65 years

Exposure: Urinary glyphosate and AMPA concentrations using GC-MS-MS

Outcome: Relative leukocyte telomere length and mtDNA content using qPCR

Linear regression models adjusted for confounding variables

## RESULTS

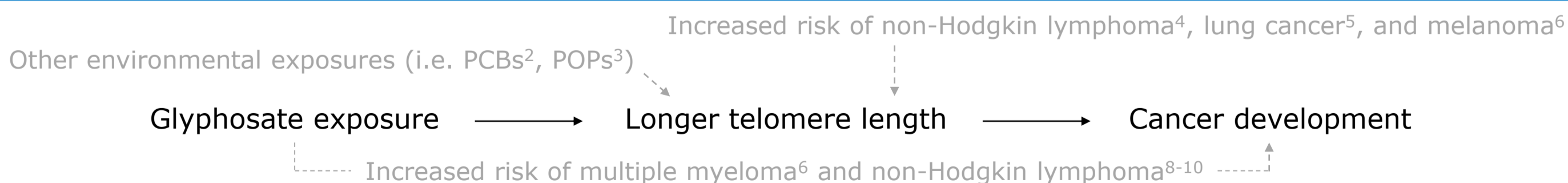


### Association between glyphosate/AMPA and markers of biological aging

	% difference (95% CI)	p-value
<b>Telomere length</b>		
Glyphosate	1.68 (-1.38 to 4.90)	0.27
AMPA	2.95 (0.07 to 5.92)	0.045*
<b>mtDNA content</b>		
Glyphosate	0.28 (-4.47 to 5.26)	0.90
AMPA	1.05 (-3.61 to 5.92)	0.66

Models were adjusted for sex, age, BMI, smoking status, alcohol consumption, socioeconomic status, season, and urine specific gravity. mtDNA content has been additionally adjusted for platelet count.

## DISCUSSION



→ **Longer telomere length is a possible mechanism for cancer development after glyphosate or AMPA exposure**

<sup>1</sup> Agostini LP *et al.* 2020; <sup>2</sup> Scinicariello F *et al.* 2015; <sup>3</sup> Shin JY *et al.* 2010; <sup>4</sup> Lan Q *et al.* 2009; <sup>5</sup> Seow WJ *et al.* 2014; <sup>6</sup> Han J *et al.* 2009; <sup>7</sup> De Roos AJ *et al.* 2005; <sup>8</sup> Eriksson M *et al.* 2008; <sup>9</sup> De Roos AJ *et al.* 2003; <sup>10</sup> McDuffie HH *et al.* 2001



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