### 1 Research Letter

## 2 Key words: incidence: celiac disease; prevalence; serologic tests

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## 4 **To the editor:**

The diagnosis rates of coeliac disease differ substantially between countries<sup>1</sup>. Intriguingly, there 5 6 has been recent evidence from Olmstead County, USA and Finland that in the last 5-10 years 7 incidence has plateaued or even declined<sup>2, 3</sup>. In most populations the prevalence also varies 8 widely, serological prevalence from 0% to 1.87% and clinical prevalence from 0.9 to 12.9 per 9  $100000^{1}$ . Understanding of why this variation exists is minimal, yet one of the key aspects 10 governing incidence rates of any disease are "health system drivers", such as the availability and use of diagnostic tests. We previously reported rising incidence rates of coeliac disease<sup>4</sup> from 11 12 1990 to 2011 with inequality by deprivation in the UK. Although national guidance on recognition and diagnosis of coeliac disease published in 2009<sup>5</sup> suggested widening the patient 13 14 groups that should be tested for coeliac disease, NHS financial constraints could have hindered implementation of these guidelines. Indeed in the USA it has been observed that over the period 15 16 2000-2010 there was a marked decrease in treated prevalence of many diseases alongside a 17 sustained period of reduced spending on health care<sup>6</sup>.

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Incidence of coeliac disease

We used the UK Clinical Practice Research Datalink GOLD (Independent Scientific Advisory Committee approval 16\_130) to estimate the European (EUROSTAT EU-27 plus EFTA 2013 population<sup>7</sup>) age-standardized incidence rates of coeliac disease<sup>8</sup> 2005-2015 and the corresponding rates of serological testing (Anti-Tissue Transglutaminase antibody (TTG) and anti-Endomysial antibody (EMA)) for the disease. We used Joinpoint analysis<sup>9</sup> to examine statistical evidence of changes in the rates of diagnosis and testing during this period. We

- 1 estimated coeliac disease point prevalence based on all contributing patients at 30<sup>th</sup> June 2015
- 2 and estimated incidence rate ratios (IRR) using Poisson regression for testing and incidence
- 3 rates.
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1	There were 8177 incident cases of coeliac diseases diagnosed among 45,539,211 million person
2	years. The overall incidence rate between 2005 and 2015 was 18 per 100,000 person years,
3	serological testing rate was 118 per 100,000 person years and point prevalence on the 30 <sup>th</sup> June
4	2015 was 0.30% (95% CI 0.30-0.31). Incidence rates of coeliac disease were highest in people
5	aged between 60 and 69 years (23 per 100,000 person-years) whereas the rate of serological
6	testing was highest in those aged 20-29 (233 per 100,000 person-years). For the calendar period
7	2005-2015 there was an increase in European age-standardardized incidence rates from 2005
8	until 2012 and then a plateauing effect (figure 1). Serological testing increased and then
9	decreased during the same period (figure 2). Joinpoint analysis identified that there were changes
10	in the rates of both diagnosis and testing at 2012.
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In this study we found that European age-standardized rates of diagnosis of coeliac disease and
serological testing have, since 2011, respectively plateaued and declined, while prevalence
increased from 0.24%<sup>4</sup> to 0.3%.

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5 This could be because since 2010 the UK NHS has been operating under a period of financial 6 austerity. While health funding has been forecast to grow 1.2 per cent in real terms between 7 2009/10 and 2020/21 this is below the long-term average increases in health spending of approximately 4 per cent a year since the NHS was established in 1948<sup>10</sup>. Alternatively, 8 9 clinicians based in primary care could be carrying out more targeted use of testing in certain age 10 or at-risk groups, leading to an overall reduction in testing. We may have missed some tests 11 carried out in secondary care as we did not have access to these. We found some evidence that 12 testing did vary by age, disproportionately to disease incidence, in that the highest testing rate 13 was in those aged 20-29 yet the highest incidence rate was in the 60-69 year old group. Finally, it is possible that following several years of increasing diagnosis rates prior to 2011<sup>4</sup> that the 14 15 threshold of clinically identifiable coeliac disease in the UK has been reached and a steady-state 16 incidence rate obtained.

# 1 Figure Legends.

2 Figure 1. European age-standardized incidence rates of coeliac disease per 100,000 person- years



^ Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level. Final Selected Model: 1 Joinpoint.

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- 1 Figure 2. European age-standardized serological testing rates per 100,000 person-years (TTG
- 2 and EMA) for coeliac disease



^ Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level. Final Selected Model: 1 Joinpoint.

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