



**17TH WORLD CONGRESS
ON PUBLIC HEALTH**
2023 May 3-6 ROME ITALY



**56[°] CONGRESSO
NAZIONALE SITI**
2-5 Maggio 2023 ROMA

Inequalities in the burden of noncommunicable diseases across European countries: a systematic analysis of the 2019 Global Burden of Disease Study

Carlos A. S. Andrade





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A WORLD IN TURMOIL:

Opportunities
to Focus on the
Public's Health.

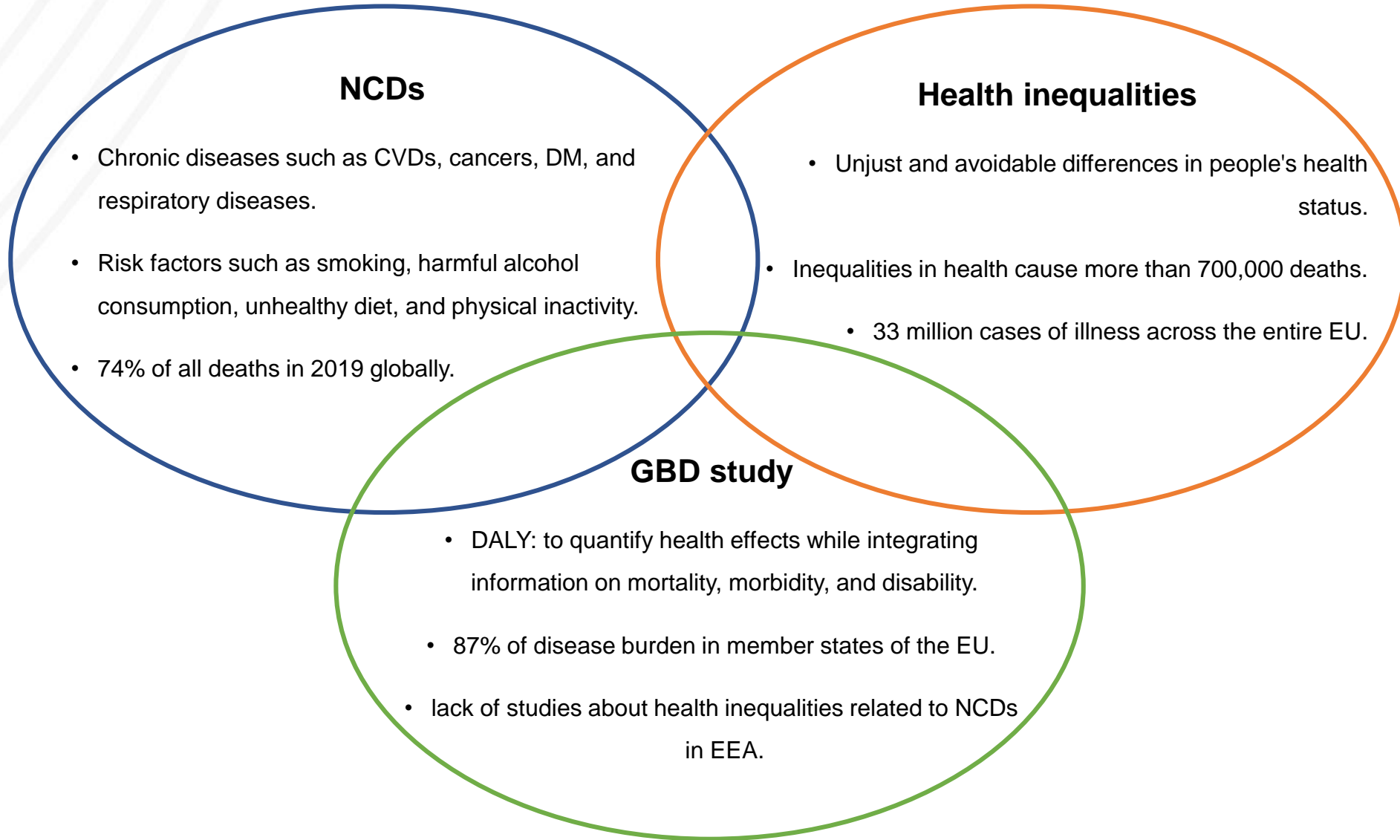


Inequalities in the burden of noncommunicable diseases across European countries: a systematic analysis of the 2019 Global Burden of Disease Study



STATEMENT SLIDE

I have no conflicts of interest to disclose



Objectives

- The overall goal of the present systematic analysis was to determine health inequalities in age-standardized DALY rate for NCDs overall and 12 specific NCDs across 30 EEA countries between 1990 and 2019.
 1. provide a description of age-standardized NCDs DALY rate by country and sex for 2019;
 2. present an age-standardized NCDs DALY rate for each country between 1990 and 2019 by sex,
 3. determine age-standardized NCDs DALY rate ratios by country and sex between 1990 and 2019, and
 4. assess health inequalities of NCDs by calculating Gini coefficient (GC) and Slope Index of Inequality (SII) between 1990 and 2019.

Material and Methods

- $\frac{\text{Higher ranking age standardized DALY rate}}{\text{Lower ranking age standardized DALY rate}} = \text{Ratio}$
 - Values closer to “1” indicate equality
 - Values above “1” indicate inequality
- $(\text{exponential}(\beta \text{ coefficient}(\text{LN}[X])) - 1) = \text{Annual rate of change}$
 - The lower the annual rate of change, the greater the decline in the DALY rate between 1990 and 2019.
- Statistical difference was considered for 95% UI (uncertainty interval) non-overlap
- The GC was used to measure the DALY rate inequalities across countries.
 - It ranges from 0 to 1, in which 0 represents perfect equality and 1 means total inequality.
- The SII was used as an additional measure of health inequality, that was used to estimate the average absolute difference in DALY rate across countries.



Results I: Age-standardized level 1 NCDs DALY rate ratios by countries and sex, 2019

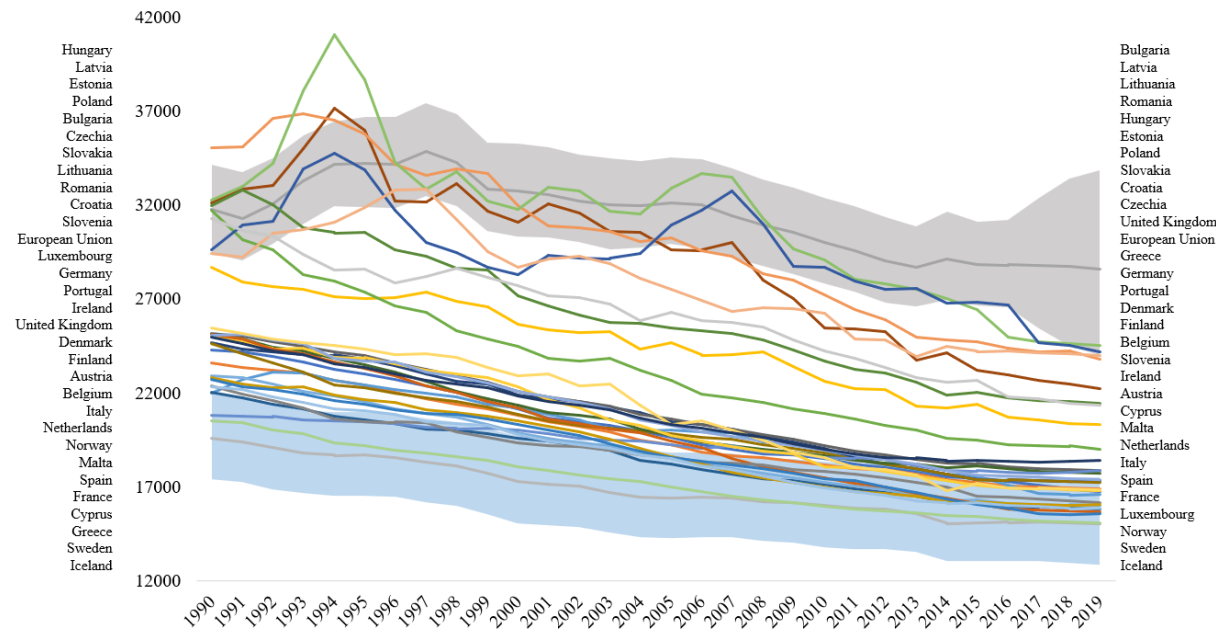
Countries	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czechia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Norway	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	UK		
	Female	16009	16314	20822	16161	16589	15642	17194	16414	15845	15322	17077	16777	17989	14816	16896	15771	17803	17208	15964	16000	16545	15894	15821	16190	17920	16769	13910	15301	15707	17766	
	Male	16716	16931	28589	20315	16599	19000	17301	22234	17243	15831	17713	17835	23763	15033	16779	15977	24497	24160	15675	16136	16044	15551	21445	17412	23955	21341	16812	15864	15115	18370	
Austria	16009	16716	1.00	1.02	1.30	1.01	1.04	1.02	1.07	1.03	1.01	1.04	1.07	1.05	1.12	1.08	1.06	1.02	1.11	1.07	1.00	1.00	1.03	1.01	1.01	1.01	1.12	1.05	1.15	1.05	1.02	1.11
Belgium	16314	16931	1.01	1.00	1.28	1.01	1.02	1.04	1.05	1.01	1.03	1.06	1.05	1.03	1.10	1.10	1.04	1.03	1.09	1.05	1.02	1.02	1.01	1.03	1.03	1.01	1.10	1.03	1.17	1.07	1.04	1.09
Bulgaria	20822	28589	1.71	1.69	1.00	1.29	1.26	1.33	1.21	1.27	1.31	1.36	1.22	1.24	1.16	1.41	1.23	1.32	1.17	1.21	1.30	1.30	1.26	1.31	1.32	1.29	1.16	1.24	1.50	1.36	1.33	1.17
Croatia	16161	20315	1.22	1.20	1.41	1.00	1.03	1.03	1.06	1.02	1.02	1.05	1.06	1.04	1.11	1.09	1.05	1.02	1.10	1.06	1.01	1.01	1.02	1.02	1.02	1.00	1.11	1.04	1.16	1.06	1.03	1.10
Cyprus	16589	16599	1.01	1.02	1.72	1.22	1.00	1.06	1.04	1.01	1.05	1.08	1.03	1.01	1.08	1.12	1.02	1.05	1.07	1.04	1.04	1.04	1.00	1.04	1.05	1.02	1.08	1.01	1.19	1.08	1.06	1.07
Czechia	15642	19000	1.14	1.12	1.50	1.07	1.14	1.00	1.10	1.05	1.01	1.02	1.09	1.07	1.15	1.06	1.08	1.01	1.14	1.10	1.02	1.02	1.06	1.02	1.01	1.04	1.15	1.07	1.12	1.02	1.00	1.14
Denmark	17194	17301	1.03	1.02	1.65	1.17	1.04	1.10	1.00	1.05	1.09	1.12	1.01	1.02	1.05	1.16	1.02	1.09	1.04	1.00	1.08	1.08	1.09	1.06	1.04	1.03	1.24	1.12	1.09	1.03	1.08	
Estonia	16414	22234	1.33	1.31	1.29	1.09	1.34	1.17	1.29	1.00	1.04	1.07	1.04	1.02	1.10	1.11	1.03	1.04	1.08	1.05	1.03	1.03	1.01	1.03	1.04	1.01	1.09	1.02	1.18	1.07	1.05	1.08
Finland	15845	17243	1.03	1.02	1.66	1.18	1.04	1.10	1.00	1.29	1.00	1.03	1.08	1.06	1.14	1.07	1.00	1.12	1.09	1.01	1.01	1.04	1.00	1.00	1.02	1.13	1.06	1.14	1.04	1.01	1.12	
France	15322	15831	1.06	1.07	1.81	1.28	1.05	1.20	1.09	1.40	1.09	1.00	1.11	1.09	1.10	1.03	1.16	1.12	1.04	1.04	1.08	1.04	1.03	1.06	1.17	1.09	1.10	1.00	1.03	1.16	1.16	
Germany	17077	17713	1.06	1.05	1.61	1.15	1.07	1.07	1.02	1.26	1.03	1.12	1.00	1.02	1.05	1.15	1.01	1.08	1.04	1.01	1.07	1.07	1.03	1.07	1.08	1.05	1.05	1.02	1.23	1.12	1.09	1.04
Greece	16777	17835	1.07	1.05	1.60	1.14	1.07	1.07	1.03	1.25	1.03	1.13	1.01	1.00	1.07	1.13	1.01	1.06	1.06	1.03	1.05	1.05	1.01	1.06	1.06	1.04	1.07	1.00	1.21	1.10	1.07	1.06
Hungary	17989	23763	1.42	1.40	1.00	1.17	1.43	1.25	1.37	1.07	1.38	1.50	1.34	1.33	1.00	1.21	1.06	1.14	1.01	1.05	1.13	1.12	1.09	1.13	1.14	1.11	1.00	1.07	1.29	1.18	1.15	1.01
Iceland	14816	15033	1.11	1.13	1.90	1.35	1.10	1.26	1.15	1.48	1.15	1.05	1.18	1.19	1.58	1.00	1.14	1.06	1.20	1.16	1.08	1.08	1.12	1.07	1.07	1.09	1.21	1.13	1.07	1.03	1.06	1.20
Ireland	16896	16779	1.00	1.01	1.70	1.21	1.01	1.13	1.03	1.33	1.03	1.06	1.06	1.42	1.12	1.00	1.07	1.05	1.02	1.06	1.06	1.02	1.06	1.07	1.04	1.06	1.01	1.21	1.10	1.08	1.05	
Italy	15771	15977	1.05	1.06	1.79	1.27	1.04	1.19	1.08	1.39	1.08	1.01	1.11	1.12	1.49	1.06	1.05	1.00	1.13	1.09	1.01	1.01	1.05	1.01	1.00	1.03	1.14	1.06	1.13	1.03	1.00	1.13
Latvia	17803	24497	1.47	1.45	1.17	1.21	1.48	1.29	1.42	1.10	1.42	1.55	1.38	1.37	1.03	1.63	1.46	1.53	1.00	1.03	1.12	1.11	1.08	1.12	1.13	1.10	1.01	1.06	1.28	1.16	1.13	1.00
Lithuania	17208	24160	1.45	1.43	1.18	1.19	1.46	1.27	1.40	1.09	1.40	1.53	1.36	1.35	1.02	1.61	1.44	1.51	1.01	1.00	1.08	1.08	1.04	1.08	1.09	1.06	1.04	1.03	1.24	1.12	1.10	1.03
Luxembourg	15964	15675	1.07	1.08	1.82	1.30	1.06	1.21	1.10	1.42	1.10	1.01	1.13	1.14	1.52	1.04	1.07	1.02	1.56	1.54	1.00	1.00	1.04	1.00	1.01	1.01	1.12	1.05	1.15	1.04	1.02	1.11
Malta	16000	16136	1.04	1.05	1.77	1.26	1.03	1.18	1.07	1.38	1.07	1.02	1.10	1.11	1.47	1.07	1.04	1.01	1.52	1.50	1.03	1.00	1.03	1.01	1.01	1.01	1.12	1.05	1.15	1.05	1.02	1.11
Netherlands	16545	16044	1.04	1.06	1.78	1.27	1.03	1.18	1.08	1.39	1.07	1.01	1.10	1.11	1.48	1.07	1.05	1.00	1.53	1.51	1.02	1.01	1.00	1.04	1.05	1.02	1.08	1.01	1.19	1.08	1.05	1.07
Norway	15894	15551	1.07	1.09	1.84	1.31	1.07	1.22	1.11	1.43	1.11	1.02	1.14	1.15	1.53	1.03	1.08	1.03	1.58	1.55	1.01	1.04	1.03	1.00	1.00	1.02	1.13	1.06	1.14	1.04	1.01	1.12
Poland	15821	21445	1.28	1.27	1.33	1.06	1.29	1.13	1.24	1.04	1.24	1.35	1.21	1.20	1.11	1.43	1.28	1.34	1.14	1.13	1.37	1.33	1.34	1.38	1.00	1.02	1.13	1.06	1.14	1.03	1.01	1.12
Portugal	16190	17412	1.04	1.03	1.64	1.17	1.05	1.09	1.01	1.28	1.01	1.10	1.02	1.02	1.36	1.16	1.04	1.09	1.41	1.39	1.11	1.08	1.09	1.12	1.23	1.00	1.11	1.04	1.16	1.06	1.03	1.10
Romania	17920	23955	1.43	1.41	1.19	1.18	1.44	1.26	1.38	1.08	1.39	1.51	1.35	1.34	1.01	1.59	1.43	1.50	1.02	1.01	1.53	1.48	1.49	1.54	1.12	1.38	1.00	1.07	1.29	1.17	1.14	1.01
Slovakia	16769	21341	1.28	1.26	1.34	1.05	1.29	1.12	1.23	1.04	1.24	1.35	1.20	1.20	1.11	1.42	1.27	1.34	1.15	1.13	1.36	1.32	1.33	1.37	1.00	1.23	1.12	1.00	1.21	1.10	1.07	1.06
Slovenia	13910	16812	1.01	1.01	1.70	1.21	1.01	1.13	1.03	1.32	1.03	1.06	1.05	1.06	1.41	1.12	1.00	1.05	1.46	1.44	1.07	1.04	1.05	1.08	1.28	1.04	1.42	1.27	1.00	1.10	1.13	1.28
Spain	15301	15864	1.05	1.07	1.80	1.28	1.05	1.20	1.09	1.40	1.09	1.00	1.12	1.12	1.50	1.06	1.06	1.01	1.54	1.52	1.01	1.02	1.01	1.02	1.35	1.10	1.51	1.35	1.06	1.00	1.03	1.16
Sweden	15707	15115	1.11	1.12	1.89	1.34	1.10	1.26	1.14	1.47	1.14	1.05	1.17	1.18	1.57	1.01	1.11	1.06	1.62	1.60	1.04	1.07	1.06	1.03	1.42	1.15	1.58	1.41	1.11	1.05	1.00	1.13
UK	17766	18370	1.10	1.09	1.56	1.11	1.11	1.03	1.06	1.21	1.07	1.16	1.04	1.03	1.29	1.22	1.09	1.15	1.33	1.32	1.17	1.14	1.14	1.18	1.17	1.06	1.30	1.16	1.09	1.16	1.22	1.00

Results I: Age-standardized level 1 NCDs DALY rate ratios by countries and sex, 2019

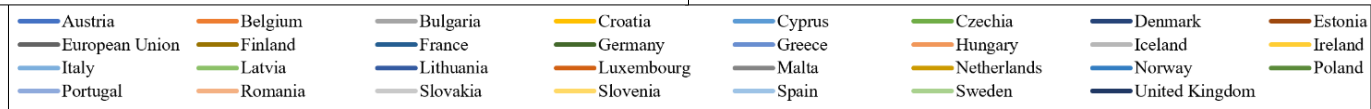
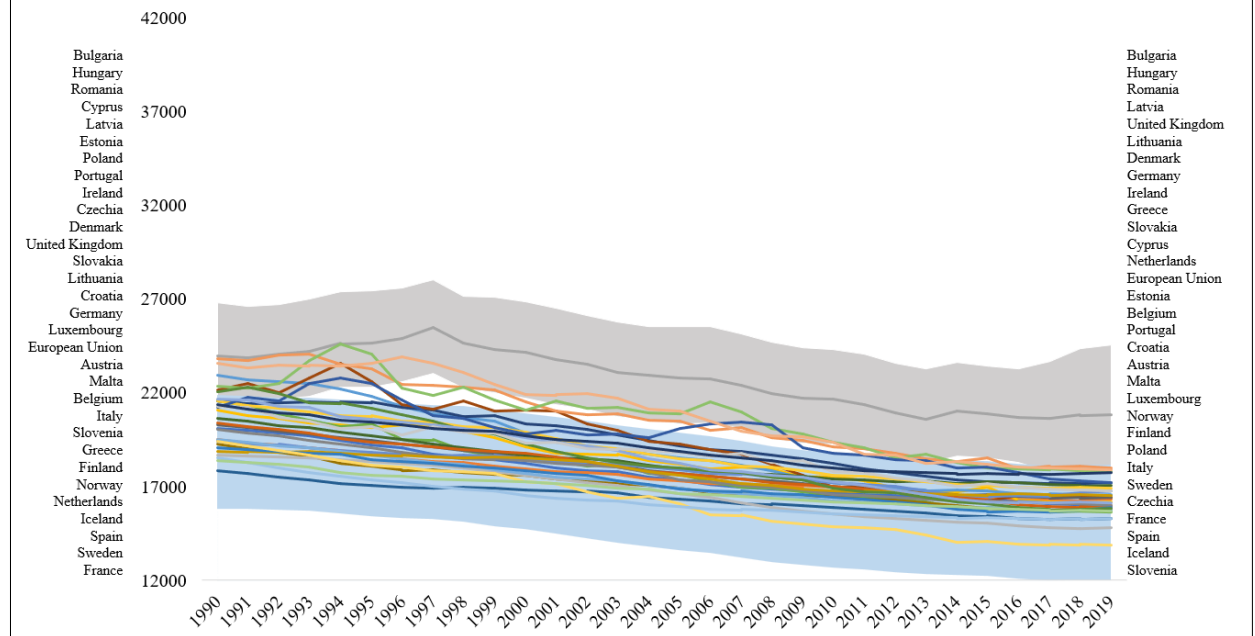
Countries			Austria	Belgium	Bulgaria	Croatia	Cyprus	Czechia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Norway	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	UK
	Female	Male	16009	16314	20822	16161	16589	15642	17194	16414	15845	15322	17077	16777	17989	14816	16896	15771	17803	17208	15964	16000	16545	15894	15821	16190	17920	16769	13910	15301	15707	17766
Austria	16009	16716	1.00	1.02	1.30	1.01	1.04	1.02	1.07	1.03	1.01	1.04	1.07	1.05	1.12	1.08	1.06	1.02	1.11	1.07	1.00	1.00	1.03	1.01	1.01	1.01	1.12	1.05	1.15	1.05	1.02	1.11
Belgium	16314	16931	1.01	1.00	1.28	1.01	1.02	1.04	1.05	1.01	1.03	1.06	1.05	1.03	1.10	1.10	1.04	1.03	1.09	1.05	1.02	1.02	1.01	1.03	1.03	1.01	1.10	1.03	1.17	1.07	1.04	1.09
Bulgaria	20822	28589	<u>1.71</u>	<u>1.69</u>	1.00	1.29	1.26	1.33	1.21	1.27	1.31	1.36	1.22	1.24	1.16	1.41	1.23	1.32	1.17	1.21	1.30	1.30	1.26	1.31	1.32	1.29	1.16	1.24	<u>1.50</u>	1.36	1.33	1.17
Croatia	16161	20315	1.22	1.20	1.41	1.00	1.03	1.03	1.06	1.02	1.02	1.05	1.06	1.04	1.11	1.09	1.05	1.02	1.10	1.06	1.01	1.01	1.02	1.02	1.02	1.00	1.11	1.04	1.16	1.06	1.03	1.10
Cyprus	16589	16599	1.01	1.02	<u>1.72</u>	1.22	1.00	1.06	1.04	1.01	1.05	1.08	1.03	1.01	1.08	1.12	1.02	1.05	1.07	1.04	1.04	1.04	1.00	1.04	1.05	1.02	1.08	1.01	1.19	1.08	1.06	1.07
Czechia	15642	19000	1.14	1.12	<u>1.50</u>	1.07	1.14	1.00	1.10	1.05	1.01	1.02	1.09	1.07	1.15	1.06	1.08	1.01	1.14	1.10	1.02	1.02	1.06	1.02	1.01	1.04	1.15	1.07	1.12	1.02	1.00	1.14
Denmark	17194	17301	1.03	1.02	<u>1.65</u>	1.17	1.04	1.10	1.00	1.05	1.09	1.12	1.01	1.02	1.05	1.16	1.02	1.09	1.04	1.04	1.08	1.07	1.04	1.08	1.09	1.06	1.04	1.03	1.24	1.12	1.09	1.03
Estonia	16414	22234	<u>1.33</u>	1.31	1.29	1.09	1.34	1.17	<u>1.25</u>	1.00	1.04	1.07	1.04	1.02	1.10	1.11	1.03	1.04	1.08	1.05	1.03	1.03	1.01	1.03	1.04	1.01	1.09	1.02	1.18	1.07	1.05	1.08
Finland	15845	17243	1.03	1.02	<u>1.66</u>	1.18	1.04	1.10	1.00	1.29	1.00	1.03	1.08	1.06	1.14	1.07	1.07	1.00	1.12	1.09	1.01	1.01	1.04	1.00	1.00	1.02	1.13	1.06	1.14	1.04	1.01	1.12
France	15322	15831	1.06	1.07	<u>1.81</u>	1.28	1.05	1.20	<u>1.40</u>	1.09	1.00	1.11	1.09	1.00	1.17	1.03	1.10	1.03	1.16	1.12	1.04	1.04	1.08	1.04	1.03	1.06	1.17	1.09	1.10	1.00	1.03	1.16
Germany	17077	17713	1.06	1.05	<u>1.61</u>	1.15	1.07	1.07	1.02	1.26	1.03	1.12	1.00	1.02	1.05	1.15	1.01	1.08	1.04	1.01	1.07	1.07	1.03	1.07	1.08	1.05	1.05	1.02	1.23	1.12	1.09	1.04
Greece	16777	17835	1.07	1.05	<u>1.60</u>	1.14	1.07	1.07	1.03	1.25	1.03	1.13	1.01	1.00	1.07	1.13	1.01	1.06	1.06	1.03	1.05	1.05	1.01	1.06	1.06	1.04	1.07	1.00	1.21	1.10	1.07	1.06
Hungary	17989	23763	<u>1.42</u>	<u>1.40</u>	1.20	1.17	<u>1.43</u>	1.25	<u>1.37</u>	1.07	<u>1.38</u>	<u>1.50</u>	<u>1.34</u>	<u>1.33</u>	1.00	1.21	1.06	1.14	1.01	1.05	1.13	1.12	1.09	1.13	1.14	1.11	1.00	1.07	1.29	1.18	1.15	1.01
Iceland	14816	15033	<u>1.42</u>	1.13	<u>1.90</u>	1.35	1.10	1.26	1.15	<u>1.48</u>	1.15	1.05	1.18	1.19	<u>1.58</u>	1.00	1.14	1.06	1.20	1.16	1.08	1.08	1.12	1.07	1.07	1.09	1.21	1.13	1.07	1.03	1.06	1.20
Ireland	16896	16779	1.00	1.01	<u>1.70</u>	1.21	1.01	1.13	1.03	1.33	1.03	1.06	1.06	1.06	<u>1.42</u>	1.12	1.00	1.07	1.05	1.02	1.06	1.06	1.02	1.06	1.07	1.04	1.06	1.01	1.21	1.10	1.08	1.05
Italy	15771	15977	1.05	1.06	<u>1.79</u>	1.27	1.04	1.19	1.08	1.39	1.08	1.01	1.11	1.12	<u>1.49</u>	1.06	1.05	1.00	1.13	1.09	1.01	1.01	1.05	1.01	1.00	1.03	1.14	1.06	1.13	1.03	1.00	1.13
Latvia	17803	24497	<u>1.47</u>	<u>1.45</u>	1.17	1.21	<u>1.48</u>	1.29	<u>1.42</u>	1.10	<u>1.42</u>	<u>1.55</u>	<u>1.38</u>	<u>1.37</u>	1.03	<u>1.63</u>	<u>1.46</u>	<u>1.53</u>	1.00	1.03	1.12	1.11	1.08	1.12	1.13	1.10	1.01	1.06	1.28	1.16	1.13	1.00
Lithuania	17208	24160	<u>1.45</u>	<u>1.43</u>	1.18	1.19	<u>1.46</u>	1.27	<u>1.40</u>	1.09	<u>1.40</u>	<u>1.53</u>	<u>1.36</u>	<u>1.35</u>	1.02	<u>1.61</u>	<u>1.44</u>	<u>1.51</u>	1.01	1.00	1.08	1.08	1.04	1.08	1.09	1.06	1.04	1.03	1.24	1.12	1.10	1.03
Luxembourg	15964	15675	1.07	1.08	<u>1.82</u>	1.30	1.06	1.21	1.10	<u>1.42</u>	1.10	1.01	1.13	1.14	<u>1.52</u>	1.04	1.07	1.02	<u>1.56</u>	<u>1.54</u>	1.00	1.00	1.04	1.00	1.01	1.01	1.12	1.05	1.15	1.04	1.02	1.11
Malta	16000	16136	1.04	1.05	<u>1.77</u>	1.26	1.03	1.18	1.07	1.38	1.07	1.02	1.10	1.11	<u>1.47</u>	1.07	1.04	1.00	<u>1.52</u>	<u>1.50</u>	1.03	1.00	1.03	1.01	1.01	1.01	1.12	1.05	1.15	1.05	1.02	1.11
Netherlands	16545	16044	1.04	1.06	<u>1.78</u>	1.27	1.03	1.18	1.08	<u>1.39</u>	1.07	1.01	1.10	1.11	<u>1.48</u>	1.07	1.05	1.00	<u>1.53</u>	<u>1.51</u>	1.02	1.01	1.00	1.04	1.05	1.02	1.08	1.01	1.19	1.08	1.05	1.07
Norway	15894	15551	1.07	1.09	<u>1.84</u>	1.31	1.07	1.22	1.11	<u>1.43</u>	1.11	1.02	1.14	1.15	<u>1.53</u>	1.03	1.08	1.00	<u>1.58</u>	<u>1.55</u>	1.01	1.04	1.03	1.00	1.00	1.02	1.13	1.06	1.14	1.04	1.01	1.12
Poland	15821	21445	1.28	1.27	1.33	1.06	1.29	1.13	1.24	1.04	1.24	1.35	1.21	1.20	1.11	<u>1.43</u>	1.28	1.34	1.14	1.13	1.37	1.33	1.34	1.38	1.00	1.02	1.13	1.06	1.14	1.03	1.01	1.12
Portugal	16190	17412	1.04	1.03	<u>1.64</u>	1.17	1.05	1.09	1.01	1.28	1.01	1.10	1.02	1.02	<u>1.36</u>	1.16	1.04	1.09	<u>1.41</u>	<u>1.39</u>	1.11	1.08	1.09	1.12	1.23	1.00	1.11	1.04	1.16	1.06	1.03	1.10
Romania	17920	23955	<u>1.43</u>	<u>1.41</u>	1.19	1.18	<u>1.44</u>	1.26	<u>1.38</u>	1.08	<u>1.39</u>	<u>1.51</u>	<u>1.35</u>	<u>1.34</u>	1.01	<u>1.59</u>	<u>1.43</u>	<u>1.50</u>	1.02	1.01	<u>1.53</u>	<u>1.48</u>	<u>1.49</u>	<u>1.54</u>	<u>1.51</u>	1.00	1.07	1.29	1.17	1.14	1.01	
Slovakia	16769	21341	1.28	1.26	1.34	1.05	1.29	1.12	1.23	1.04	1.24	1.35	1.20	1.20	1.11	<u>1.42</u>	1.07	1.34	1.15	1.13	1.36	1.32	1.33	1.37	1.00	1.23	1.12	1.00	1.21	1.10	1.07	1.06
Slovenia	13910	16812	1.01	1.01	<u>1.70</u>	1.21	1.01	1.13	1.03	1.32	1.03	1.05	1.06	1.06	<u>1.41</u>	1.12	1.00	1.05	<u>1.46</u>	<u>1.44</u>	1.07	1.04	1.05	1.08	1.00	1.04	<u>1.42</u>	1.27	1.00	1.10	1.13	1.28
Spain	15301	15864	1.05	1.07	<u>1.80</u>	1.28	1.05	1.20	1.09	<u>1.40</u>	1.09	1.00	1.12	1.12	<u>1.50</u>	1.06	1.00	1.01	<u>1.54</u>	<u>1.52</u>	1.01	1.02	1.01	1.02	1.35	1.10	<u>1.51</u>	1.35	1.06	1.00	1.03	1.16
Sweden	15707	15115	1.11	1.12	<u>1.89</u>	1.34	1.10	1.26	1.14	<u>1.47</u>	1.14	1.05	1.17	1.18	<u>1.57</u>	1.01	1.11	1.06	<u>1.62</u>	<u>1.60</u>	1.04	1.07	1.06	1.03	<u>1.42</u>	1.15	<u>1.58</u>	<u>1.41</u>	1.11	1.05	1.00	1.13
UK	17766	18370	1.10	1.09	<u>1.56</u>	1.11	1.11	1.03	1.06	1.21	1.07	1.16	1.04	1.03	1.29	1.22	1.09	1.15	1.33	1.32	1.17	1.14	1.14	1.18	1.17	1.06	1.30	1.16	1.09	1.16	1.22	1.00

Results II: Changes in NCDs DALY rate between 1990 and 2019

Age-standardized DALY rate in males

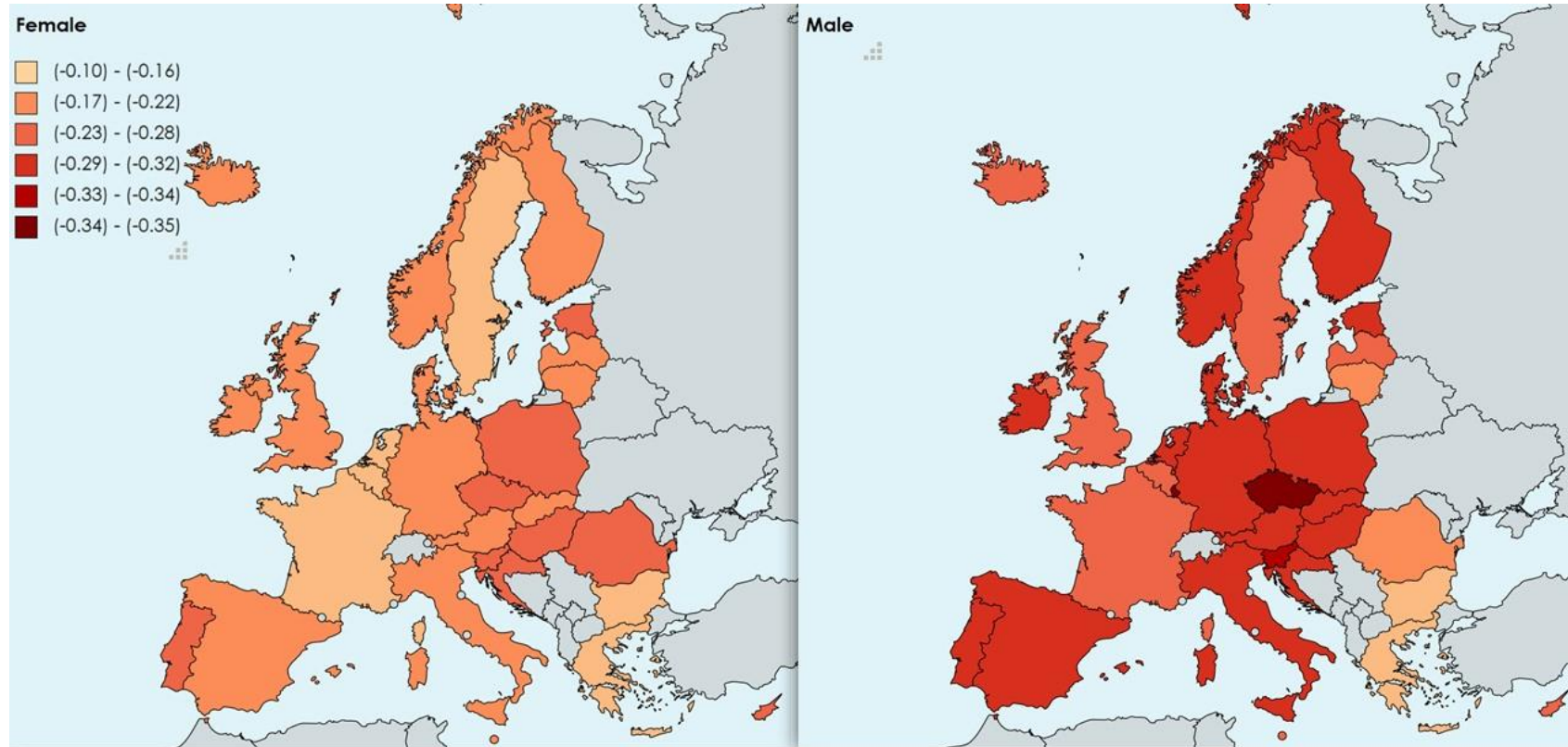


Age-standardized DALY rate in females

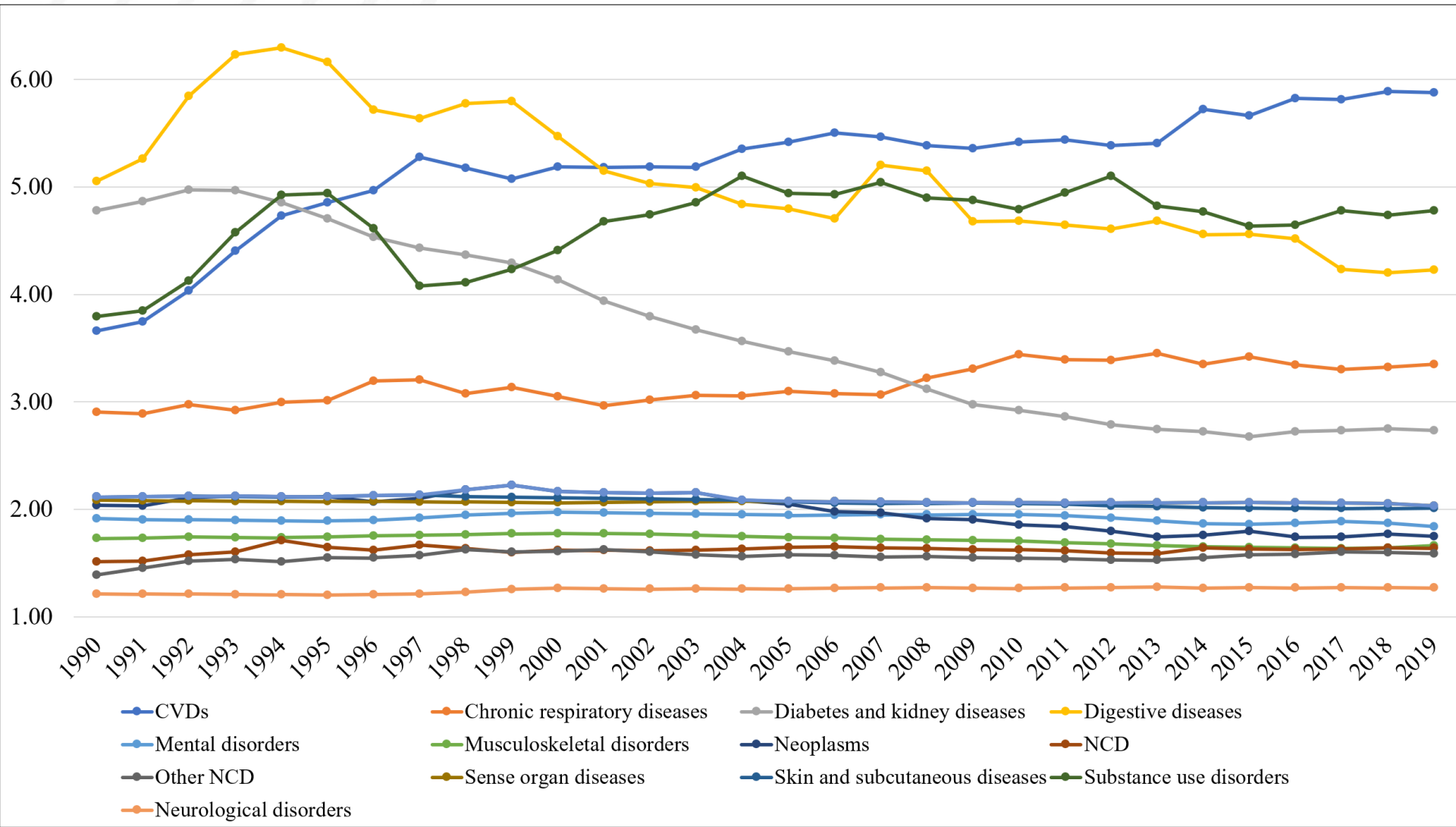


Results III: Annual rate of change in age-standardized NCDs DALY rates

- Level of change in females ranged from -0.12 (95% UI: -0.10 to -0.15) in the Netherlands to -0.28 (95% UI: -0.17 to -0.40) in Slovenia and (95% UI: -0.21 to -0.35) Poland.
- The change in males ranged from -0.10 (95% UI: 0.06 to -0.23) in Bulgaria to -0.40 (95% UI: -0.32 to -0.47) in Czechia.



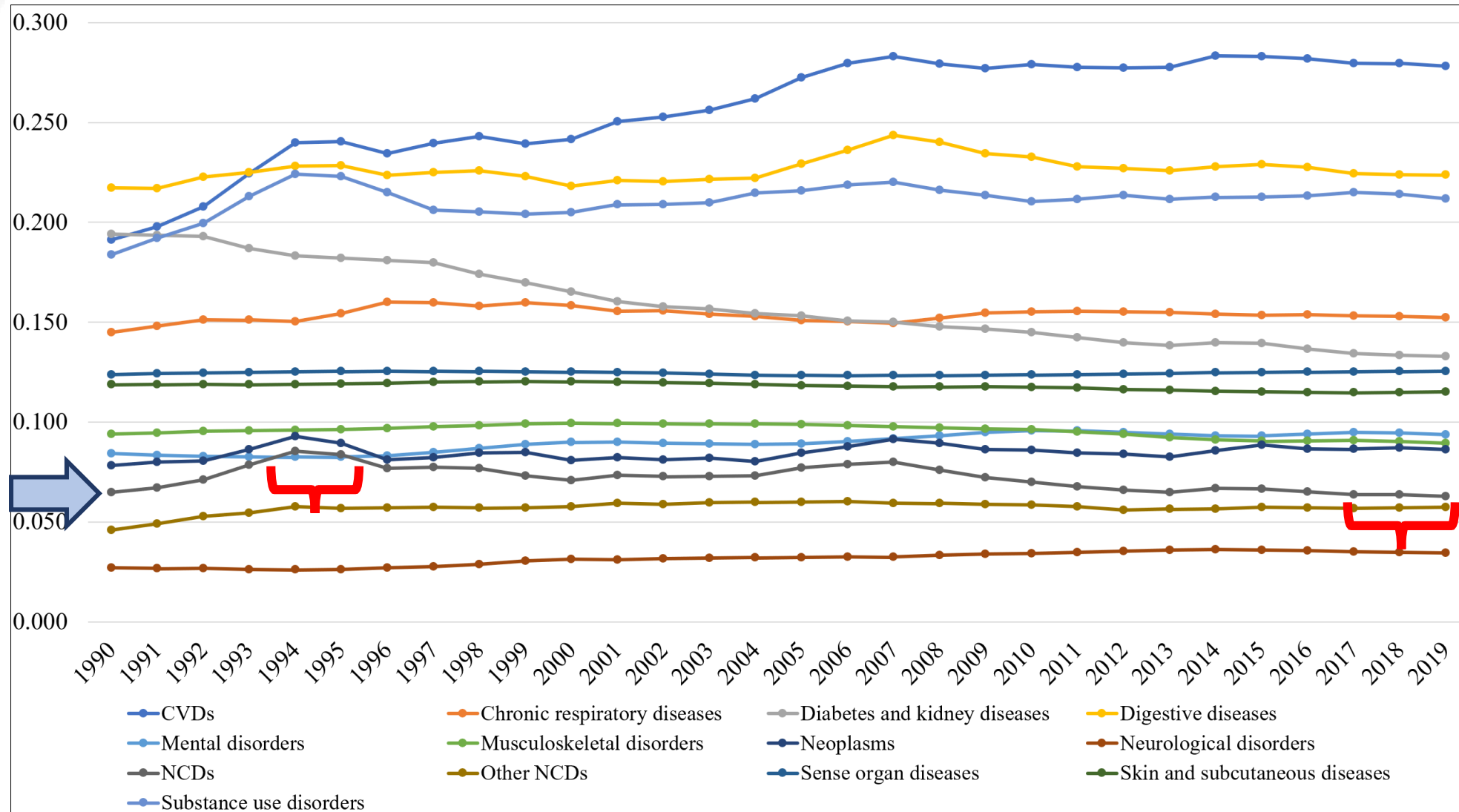
Results IV: NCDs DALYs rate ratios by level 2 NCD cause of disease



- Five NCDs had consistent ratios of 2.68 or higher:
 - Digestive diseases, DM and kidney diseases, substance use disorders, CVDs, and chronic respiratory diseases.
- For CVDs, the ratio increased from 3.66 (1990) to 5.88 (2019).
- For digestive diseases and DM and kidney diseases a decrease in ratio was observed between 1990 and 2019.
- For NCDs, musculoskeletal disorders, mental disorders, neoplasms, and sense organ diseases the DALY rate ratio was consistently lower than 2.23 between 1990 and 2019.

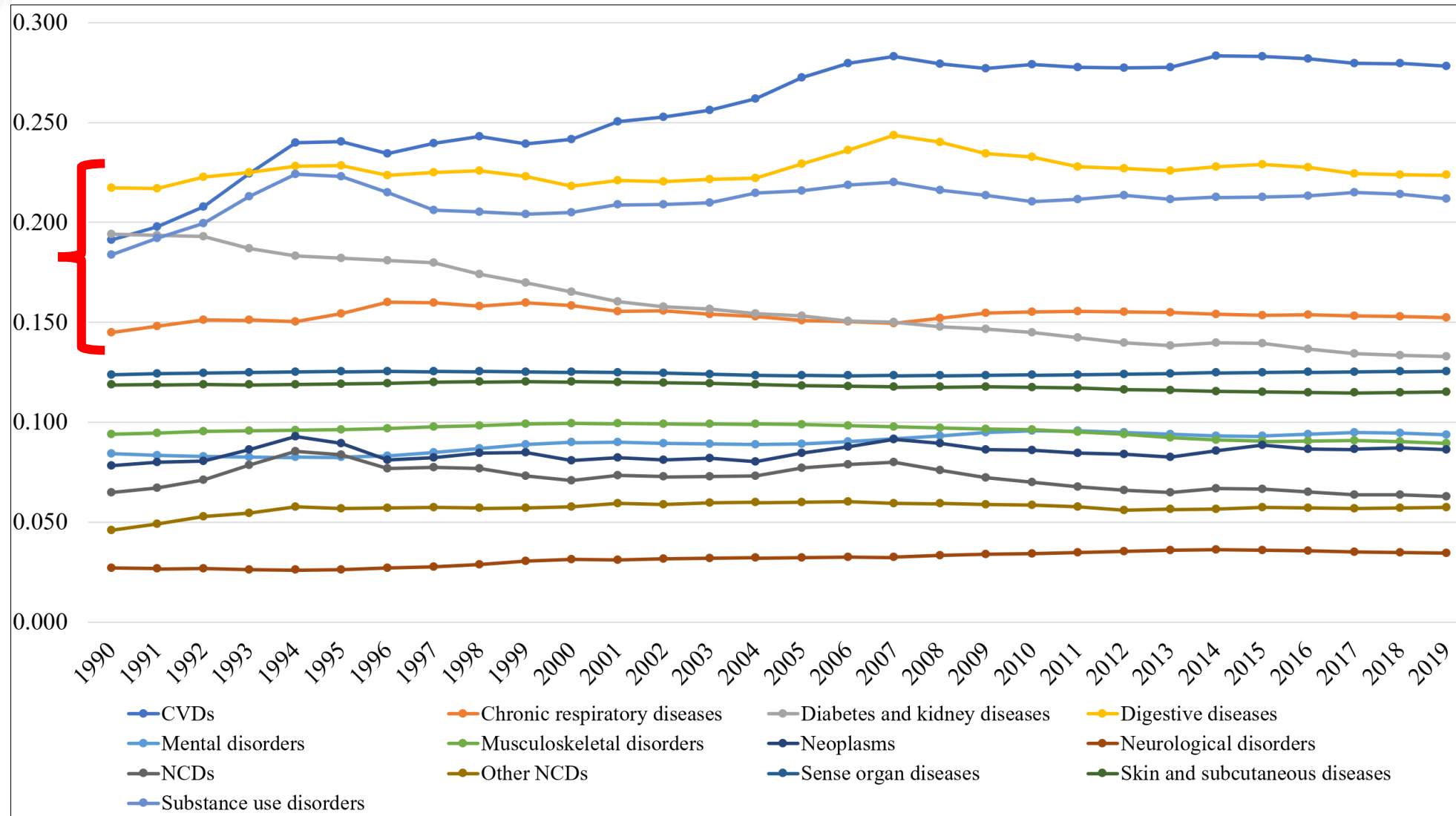
Results V: Assessing health inequalities in NCDs by using Gini coefficient

- Low inequalities according to the GC between countries were found for NCD (level 1).
- The lowest GC were found between 2017 and 2019, between **0.064** (95% CI: 0.044 to 0.083) and **0.063** (95% CI: 0.040 0.086).
- The highest GC was observed in 1994 and 1995, which were **0.085** (95% CI: 0.065 to 0.106) and **0.084** (95% CI: 0.067 to 0.101).

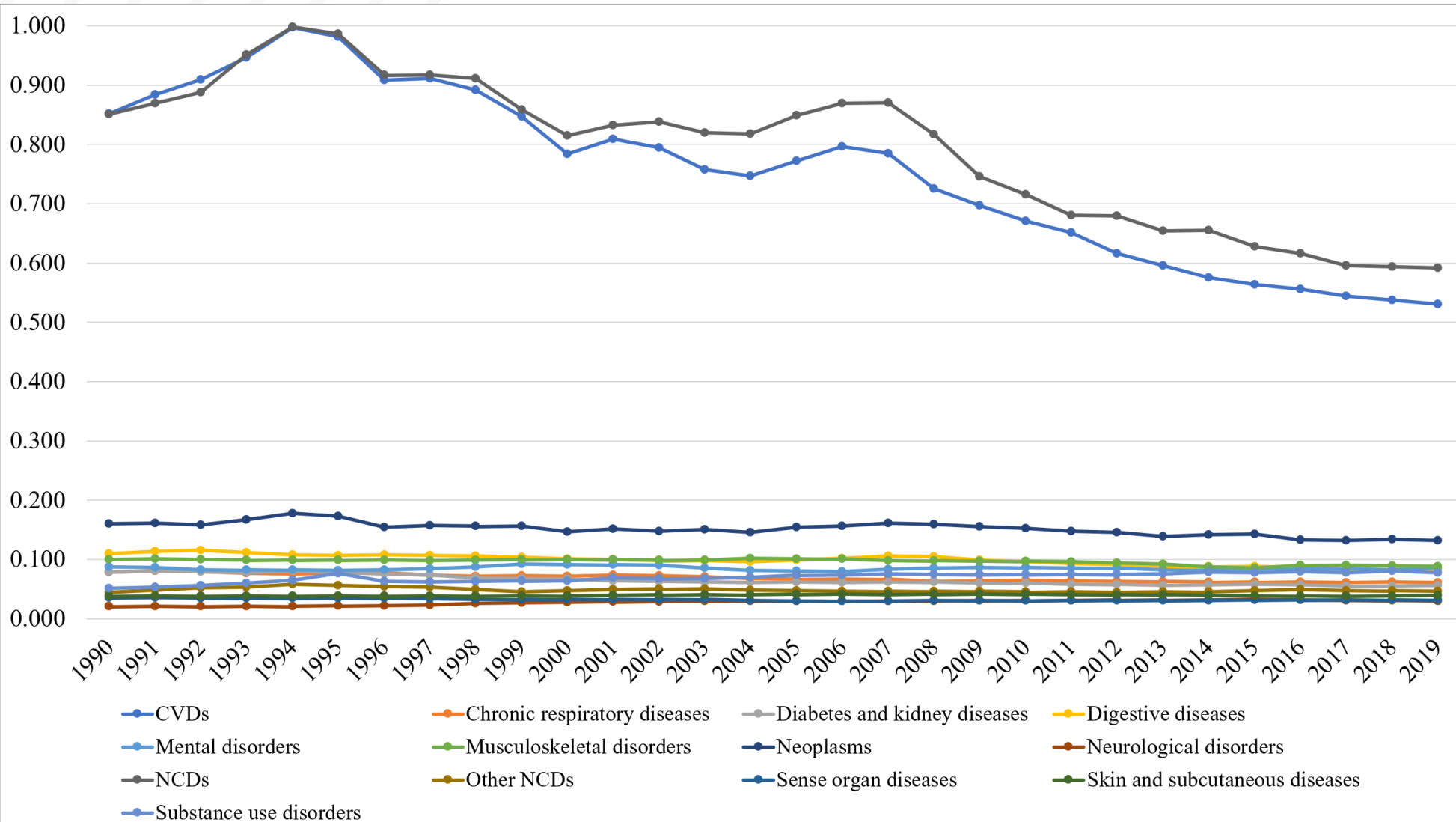


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- The highest GC was observed in 1994 and 1995, which were **0.085** (95% CI: 0.065 to 0.106) and **0.084** (95% CI: 0.067 to 0.101).
- The highest GCs are observed for CVD (0.283), chronic respiratory diseases (0.160), diabetes and kidney diseases (0.194), digestive diseases (0.244), and substance use disorders (0.224).



Results VI: Assessing health inequalities in NCDs by using Slope Index of Inequality (SII)



- The SII was highest for level 1 NCDs:
 - 0.851 (95% CI: 0.730-0.972) in 1990 and 0.592 (95% CI: 0.470-0.715) in 2019
- Two peaks in 1994 and 2007.
- CVDs in 1990, 1994, 2007, and 2019: 0.852 (0.708 to 0.997), 0.997 (0.776 to 1.245), 0.784 (0.569 to 1.000), and 0.531 (0.381 to 0.681), respectively.
- For a group of level 2 diseases, the SII was very close to zero over the follow-up years.
- They ranged from 0.021 (neurological disorders in 1990) to 0.115 (digestive diseases in 1992).



Conclusions

- NCDs with higher level of inequality across countries of EEA are CVDs, digestive diseases, diabetes and kidney diseases, substance use disorders, and chronic respiratory diseases.
- GC analysis showed that the level 1 NCDs DALYs inequality within all included countries is narrow.
- DALY rate from NCDs decreased between 1990 and 2019 in all the 30 EEA member states.
- The rate of change varied between males and females and across regions and was larger for males and in Central European countries.
- Underlying social inequalities could be reduced through the right mix of policies that target modifiable risk factors.

Presenter

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