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Developing and evaluating national severity distributions for use in Burden of Disease studies: a case study of cancers in Scotland

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Background

Increasingly Burden of Disease (BOD) measures are being used to influence policy decisions because they summarise health loss in an equitable manner. An important part of producing non-fatal BOD estimates are severity distributions (SDs). The Global Burden of Disease (GBD) study use the same SDs across countries due to a lack of available data.

Aim

To develop and assess the impact of national SDs compared with GBD worldwide severity distributions for 21 cancer types.

Methods

Patient-level records from the Scottish Cancer Registry for 21 cancers were obtained and linked to death registrations. We estimated prevalent cancer cases for 2016 and assigned each case to one of four phases (diagnosis and treatment; controlled; metastatic; and terminal) using GBD 2016 study definitions. SDs were calculated by considering relative proportions. The impact of choice of SDs was evaluated by comparing relative differences between weighted-average disability weights (DW) derived using GBD 2016 worldwide SDs with those derived from Scottish SDs.

Results

For the majority of cancers the most prevalent phase was the controlled phase, which contributed a higher proportion than the combined proportion from the other three phases across all cancers except mesothelioma. Differences in the composition of severity meant that most point-estimates of Scottish severity proportions were out-with the 95% uncertainty intervals. These differences resulted in overestimates of weighted-average DWs based on GBD 2016 worldwide SDs (17 out of 21 cancer types). The largest relative overestimates were for

gallbladder and biliary tract cancer, oesophageal cancer and pancreatic cancer (71%, 32% and 31% higher respectively).

Conclusion

These findings illustrate a systematic bias introduced by using worldwide SDs. Current non-fatal BOD estimates should not be interpreted too precisely when comparing populations when they rely on data inputs from other countries. It is essential to ensure that any estimates are based upon country-specific data as far as possible.

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