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Interventions to improve media coverage of medical research: a codesigned feasibility and acceptability study with Australian journalists

Tessa Copp 1, Thomas Dakin, 1 Brooke Nickel 2, 1 Loai Albarqouni 2, 1 Liam Mannix 3, Kirsten J McCaffery 2, 1 Alexandra Barratt, 1 Ray Moynihan 2

ABSTRACT

Objectives Although the media can influence public perceptions and utilisation of healthcare, journalists generally receive no routine training in interpreting and reporting on medical research. Given growing evidence about the problems of medical overuse, the need for quality media reporting has become a greater priority. This study aimed to codesign and assess the feasibility of a multicomponent training intervention for journalists in Australia.

Design A small pragmatic feasibility study using a pre- and postdesign.

Setting 90 min online workshop.

Participants Eight journalists currently working in Australia, recruited through the study’s journalist advisor and existing contacts of the researchers.

Intervention The training intervention covered a range of topics, including study designs, conflicts of interest, misleading medical statistics, population screening and overdiagnosis. The intervention also provided tools to help journalists with reporting, including a Tip Sheet and list of expert contacts in health and medicine. Preworkshop and postworkshop questionnaires were administered via Qualtrics.

Measures Acceptability and feasibility of the intervention, and journalists’ knowledge of overdiagnosis and common issues with health stories. Quantitative results were analysed descriptively using SPSS. Qualitative data were thematically analysed.

Results All participants completed preworkshop and postworkshop questionnaires, and 6 completed the 6-week follow-up (75% retention). Feasibility findings suggest the intervention is acceptable and relevant to journalists, with participants indicating the workshop increased confidence with reporting on medical research. We observed increases in knowledge preworkshop to postworkshop for all knowledge measures on overdiagnosis and common issues with media coverage of medicine. Analysis of free-text responses identified several areas for improvement, such as including more examples to aid understanding of the counterintuitive topic of overdiagnosis and more time for discussion.

Conclusions Pilot suggested the multicomponent training intervention is acceptable to journalists and provided important feedback and insights to inform a future trial of the intervention’s impact on media coverage of medicine.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ First pilot study to test the acceptability and feasibility of a codesigned, multicomponent training intervention for journalists in Australia.

⇒ This study was based on qualitative findings from journalist interviews and continuous discussion with the team’s journalist advisor.

⇒ While recruitment was challenging and the final sample was small, limiting generalisability, this study provides useful data for planning a larger trial.

⇒ Acceptable retention at 6 weeks postintervention, despite coinciding with the Omicron outbreak in Australia.

⇒ We did not assess the impact of the training on actual medical reporting, which is an important direction for future research.

INTRODUCTION

Journalists who report on health have a very difficult role, often translating complex science under deadlines into news that the public can understand. 1 Despite many initiatives in this area, 2 3 journalists generally receive no routine training in how to interpret or present medical research, 4 5 and studies have found the quality of media coverage of medicine is often poor globally. 6 Research has shown that media stories frequently emphasise the potential benefits of health interventions and under-report the harms, ignore important conflicts of interest, report numbers in misleading ways and frequently fail to report important study limitations. 6 7 As the media has a powerful influence on the public’s perceptions, behaviours and utilisation of healthcare, 8 9 quality medical reporting is essential to ensure accurate portrayal of health and science information, which in turn can shape the health of the population. 10 Given evidence has grown on the broader problems of medical excess, including overdiagnosis and overuse, 11–13 the
need for quality media reporting has become a greater priority.

The promotion of early detection tests through the media has been recognised as an important driver of overdiagnosis. Overdiagnosis occurs when individuals are labelled with a technically correct diagnosis that does not improve health outcomes or causes more harm than benefit, and is now recognised as a key challenge to human health and health system sustainability. A recent cross-sectional study of global media coverage of over 1000 media stories about five early detection tests (eg, three-dimensional mammography for breast cancer, liquid biopsy for cancer, blood biomarker tests for dementia) found that the potential benefits of testing were presented far more frequently than any potential harms (97% vs 37%, respectively), and the risk of overdiagnosis was only mentioned in 5% of stories. The general public and patients already tend to overestimate the benefits of early detection, meaning that the media’s often unrealistic and overly optimistic portrayals can reinforce these perceptions. Research has also found media coverage can influence patterns of healthcare utilisation, with positive coverage of a test or treatment associated with increases in utilisation.

Given the powerful role that media can play in perpetuating the lack of awareness of the downsides of healthcare interventions, including early detection tests, strategies to improve media reporting of tests and overdiagnosis are needed. A recent qualitative study with 22 Australian health journalists found that lack of knowledge, training and time pressure were perceived to be the main barriers to balanced, critical reporting. Journalists felt that access to very short training programmes, ongoing support and information about both benefits and potential harms would enable more high-quality medical reporting. Building on these findings, this study aimed to develop and codesign a multicomponent training intervention for journalists in Australia, with a particular focus on the benefits and harms of diagnostic tests, including overdiagnosis. We also sought to explore the feasibility and acceptability of the intervention in a small pragmatic pilot with journalists, to inform the development of a randomised trial to improve journalists’ capacity to report more responsibly on medical tests and treatments.

## METHODS

### Phase 1: codesign and development of the multicomponent intervention

We developed a multicomponent, educational and behavioural intervention for Australian journalists, with the aim of trying to help improve media reporting of medical tests, treatments and diagnoses. This was based on our qualitative findings with journalists and continuous discussion with the team’s journalist advisor and coinvestigator (LM; a national science reporter), which found high interest in very short training workshops as well as access to more resources and ongoing support. Suggestions from journalists included checklists, access to expertise for comment, fact-checking and reminders. Building on these findings and the key components of the Capability, Opportunity, Motivation and Behaviour (COM-B) model, our multidisciplinary team of journalists, researchers and clinicians developed the intervention components and content, resulting in (1) a 1.5-hour training workshop, (2) a tip sheet for guiding medical reporting and (3) an extensive list of expert contacts for independent comment or fact-checking. These intervention components were designed to address key constructs of the COM-B model by increasing knowledge, awareness, education and skills (capability), provide resources (opportunity) and increase confidence in reporting on medical research (motivation).

### Workshop

Based on our previous findings and discussions, the workshop was kept as short as possible, delivered over 90 min during a journalists’ lunchtime, by one journalist and three researchers with expertise in evidence-based medicine and overdiagnosis. The workshop covered a range of topics to address issues with media coverage of medicine highlighted in the current literature, with

<table>
<thead>
<tr>
<th>Topic</th>
<th>Brief description of content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overdiagnosis</td>
<td>1. What is overdiagnosis and what drives it.</td>
</tr>
<tr>
<td></td>
<td>2. Types and examples of conditions overdiagnosed.</td>
</tr>
<tr>
<td>Key drivers of overdiagnosis</td>
<td>1. Expanding disease definitions.</td>
</tr>
<tr>
<td></td>
<td>2. How disease definitions are defined (not fixed in nature but defined by professionals).</td>
</tr>
<tr>
<td></td>
<td>3. Screening and early detection.</td>
</tr>
<tr>
<td>Conflicts of interest</td>
<td>1. Conflicts of interest are widespread across medicine.</td>
</tr>
<tr>
<td></td>
<td>2. Why conflicts of interest matter.</td>
</tr>
<tr>
<td></td>
<td>3. Media coverage often fails to disclose conflicts of interest.</td>
</tr>
<tr>
<td>Study types and strength of evidence</td>
<td>1. Strengths and limitations of different study designs.</td>
</tr>
<tr>
<td></td>
<td>2. Preliminary findings (conference abstracts, preprints) vs peer reviewed literature.</td>
</tr>
<tr>
<td>Misleading medical statistics</td>
<td>1. Absolute versus relative risks, how relative terms can mislead by exaggerating benefits.</td>
</tr>
<tr>
<td></td>
<td>2. Misleading statistics and biases regarding screening tests, that is, survival rates, lead time bias, length time bias.</td>
</tr>
</tbody>
</table>
Informed by previous work, the Tip Sheet included additional material, workshop slides, pauses for questions (see online supplemental file 1 for further information), and one group activity and several short questions asked participants to indicate what proves a particular focus on overdiagnosis (table 1). The workshop also included one group activity and several short questions for discussion. Advertisement and recruitment were conducted for the workshop. Interested participants emailed the study team's journalist advisor (LM) and existing contacts of Australia, who were recruited by email through the Media outlet.

Table 2 Demographic characteristics of sample (N=8)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>40 (10.95)</td>
</tr>
<tr>
<td>Years of experience working as a journalist</td>
<td>11 (10.19)</td>
</tr>
<tr>
<td>Gender</td>
<td>N</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
</tr>
<tr>
<td>Role</td>
<td></td>
</tr>
<tr>
<td>Health editor</td>
<td>3</td>
</tr>
<tr>
<td>Health and medical reporter</td>
<td>4</td>
</tr>
<tr>
<td>Social affairs reporter</td>
<td>1</td>
</tr>
<tr>
<td>Media outlet</td>
<td></td>
</tr>
<tr>
<td>A major publisher of research-based news</td>
<td>2</td>
</tr>
<tr>
<td>A public broadcaster</td>
<td>1</td>
</tr>
<tr>
<td>A specialty medical website</td>
<td>3</td>
</tr>
<tr>
<td>A major newspaper group</td>
<td>2</td>
</tr>
</tbody>
</table>

Additional materials to support reporting on medicine

A Tip Sheet was created to help guide journalists’ reporting on medical tests, treatments and diagnoses. Informed by previous work, the Tip Sheet included five simple, important questions and cautions to consider when writing stories on medicine, reflecting the content of the workshop (see online supplemental appendix B). A short and long version were designed to ensure the Tip Sheet was as clear and concise as possible, with links to additional resources. The Tip Sheet was delivered via zoom due to COVID-19 restrictions. Only one group activity and several short questions were asked for discussion. Advertisement and recruitment commenced 2 weeks before the workshop, in the midst of the COVID-19 pandemic, and on the eve of the Omicron outbreak in Australia.

Outcome measures

Data were collected online via Qualtrics survey software immediately before (preworkshop), directly after (postworkshop) and 6 weeks after exposure (6-week follow-up) to the workshop.

Efficacy and acceptability outcomes

Along with collecting demographics (age, gender, years’ experience as a journalist, current role, media outlet), baseline confidence understanding medical statistics and awareness of the term ‘overdiagnosis’, a number of adapted or purpose-designed measures were administered preworkshop, postworkshop and at 6 weeks follow-up to assess the efficacy of the intervention in improving journalists’ knowledge of overdiagnosis and common issues with media coverage of medicine.

Understanding of how diseases are defined. Four items were developed by the investigators to assess participants’ understanding of how diseases are defined (eg, ‘Disease definitions are based on distinct and objective biological structures or processes’), measured on a 5-point Likert scale (1=strongly disagree to 5=strongly agree).

Interpretation of relative and absolute risks. Two items from the validated 18-item test of patients’ medical data interpretation skills were utilised to assess journalists’ interpretation of relative and absolute risks.

Acceptability and feasibility. A number of quantitative items measured on five-point Likert scales and as free-text questions assessed key feasibility and acceptability outcomes, including attitudes, perceived burden, understanding, perceived effectiveness and self-efficacy. Personal thoughts and reflections of the workshop facilitators were also collected and recorded.
<table>
<thead>
<tr>
<th>Item</th>
<th>Preworkshop (N=8) n (%)</th>
<th>Postworkshop (N=8) n (%)</th>
<th>6-week follow-up (N=6) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seen or heard of the term 'overdiagnosis' before (yes/no) Yes</td>
<td>8 (100)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Please briefly describe what overdiagnosis means in your own words</td>
<td>4 (50)</td>
<td>8 (100)</td>
<td>5 (83)</td>
</tr>
<tr>
<td>Routine screening means testing healthy, asymptomatic people to find signs of diseases such as cancer. Do you think routine screening tests for healthy people are almost always a good idea?27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6 (75)</td>
<td>0</td>
<td>1 (17)</td>
</tr>
<tr>
<td>No</td>
<td>2 (25)</td>
<td>5 (63)</td>
<td>4 (67)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>0</td>
<td>3 (38)</td>
<td>1 (17)</td>
</tr>
<tr>
<td>All cancers will cause illness and death if they are not found or treated25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True</td>
<td>1 (13)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>False*</td>
<td>6 (75)</td>
<td>8 (100)</td>
<td>6 (100)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>1 (13)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Have you ever heard of cancers that grow so slowly that they are unlikely to cause you problems in your lifetime?27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1 (13)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yes</td>
<td>7 (88)</td>
<td>8 (100)</td>
<td>6 (100)</td>
</tr>
<tr>
<td>Some screening programmes (eg, prostate cancer) lead some people with harmless cancers to get treatment they do not need (would not benefit from)24 (True/false/don’t know)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True*</td>
<td>5 (63)</td>
<td>8 (100)</td>
<td>6 (100)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>3 (38)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Some screening programmes (eg, mammography for breast cancer) find harmless cancers more often than they prevent deaths from cancer24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True*</td>
<td>2 (25)</td>
<td>6 (75)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>False</td>
<td>3 (38)</td>
<td>1 (13)</td>
<td>0</td>
</tr>
<tr>
<td>Don’t know</td>
<td>3 (38)</td>
<td>1 (13)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>Disease definitions are based on distinct and objective biological structures or processes (`strongly disagree’ to ‘strongly agree’)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>3 (38)</td>
<td>3 (50)</td>
<td>2 (33)</td>
</tr>
<tr>
<td>Somewhat disagree</td>
<td>2 (25)</td>
<td>2 (25)</td>
<td>2 (33)</td>
</tr>
<tr>
<td>Neither agree nor disagree</td>
<td>1 (13)</td>
<td>1 (13)</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat agree</td>
<td>2 (5)</td>
<td>1 (13)</td>
<td>2 (33)</td>
</tr>
<tr>
<td>Definitions of diseases and conditions can change over time (`strongly disagree’ to ‘strongly agree’)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat agree</td>
<td>0</td>
<td>1 (13)</td>
<td>2 (33)</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>8 (100)</td>
<td>7 (88)</td>
<td>4 (67)</td>
</tr>
<tr>
<td>Diseases can be defined arbitrarily and subjectively by a group of people who decide where the threshold between ‘normal’ and disease lies (`strongly disagree’ to ‘strongly agree’)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat agree</td>
<td>4 (50)</td>
<td>3 (38)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>4 (50)</td>
<td>5 (63)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>Diseases are often defined by people or organisations with financial ties to companies selling products for that disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>1 (13)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat disagree</td>
<td>2 (25)</td>
<td>0</td>
<td>1 (17)</td>
</tr>
<tr>
<td>Neither agree nor disagree</td>
<td>3 (38)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat agree</td>
<td>1 (13)</td>
<td>6 (75)</td>
<td>5 (83)</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>1 (13)</td>
<td>2 (25)</td>
<td>0</td>
</tr>
</tbody>
</table>

Continued
Patient and public involvement
This study was based on our qualitative findings with journalists and continuous discussion with the team's journalist advisor, who was involved from study conception, gave continuous feedback on workshop format, length and materials, and played a key role in recruiting study participants and facilitating the workshop.

Analyses
Quantitative results for each timepoint were analysed descriptively using absolute and relative frequencies using SPSS V.26. Qualitative data were analysed using thematic analysis31 to identify preliminary themes and patterns in the small amount of free-text responses, along with observations from workshop facilitators. Drawing on our previous work26 32 to assess participants' written understanding of overdiagnosis ('please briefly describe overdiagnosis in your own words'), responses were coded as correct if they stated it was a diagnosis that is either (1) unnecessary, (2) does not improve health outcomes or would not cause harm if left undetected or (3) leads to harm or causes more harm than benefit. Responses that did not mention one of these three aspects or described a false positive (an incorrect diagnosis) were marked as incorrect. Responses were double-coded by two researchers independently (TC and BN) to ensure rigour, with any discrepancies discussed with a third researcher (TD).

RESULTS
Pilot demographics
Out of the 10 journalists who registered, 8 journalists participated in the training workshop, held on 3 November 2021. All eight participants completed the preworkshop and postworkshop questionnaire, and 6 completed the 6-week follow-up (December 2022; 75% retention). Journalists worked at a range of media outlets (a major newspaper group, a public broadcaster, a specialty medical website, a major publisher of

Table 3

<table>
<thead>
<tr>
<th>Item</th>
<th>Preworkshop (N=8) n (%)</th>
<th>Postworkshop (N=8) n (%)</th>
<th>6-week follow-up (N=6) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>**Which out of the following proves that a cancer screening test 'saves lives'?**28 (Proves/Does not prove/Don't know)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More cancers are detected in screening populations than in unscreened populations</td>
<td>1 (13)</td>
<td>0</td>
<td>1 (17)</td>
</tr>
<tr>
<td>Does not prove*</td>
<td>7 (88)</td>
<td>8 (100)</td>
<td>5 (83)</td>
</tr>
<tr>
<td>Screen-detected cancers have better 5-year survival rates than cancers detected because of symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proves</td>
<td>3 (38)</td>
<td>1 (13)</td>
<td>0</td>
</tr>
<tr>
<td>Does not prove*</td>
<td>2 (25)</td>
<td>7 (88)</td>
<td>4 (67)</td>
</tr>
<tr>
<td>Mortality rates are lower among screened persons than unscreened persons in a randomised trial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proves*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does not prove</td>
<td>1 (13)</td>
<td>0</td>
<td>1 (17)</td>
</tr>
<tr>
<td>Don't know</td>
<td>3 (28)</td>
<td>0</td>
<td>2 (33)</td>
</tr>
<tr>
<td>Which study type is considered the strongest level of evidence? (Expert opinion/ RCT/SR/Case-control/Cross-sectional/ Cohort)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RCT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systematic review and meta-analysis*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In a new randomised study, people either took pill X or placebo (a sugar pill). 3% of people taking placebo died; 1% of people taking pill X died.29 Which statement is correct about how pill X changes the chance of death?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowers by 66%*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowers by 33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raises by 33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Which statement is correct about how pill X changes the chance of death?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 fewer deaths per 100 people*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 more deaths per 100 people</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Correct answer.

RCT, randomised controlled trial.
research-based news) and varied in years of experience working as a journalist (range: 1–25 years; see table 2). Most, however, were female, and had current roles in health and medical reporting.

Reported confidence in understanding and interpreting medical statistics was relatively high preworkshop, with five participants (62.5%) indicating it was ‘easy’ or ‘very easy’ to understand medical statistics, six participants ‘somewhat’ or ‘strongly’ agreeing with the statement ‘I am confident that I can make sense of medical statistics’, and six participants ‘somewhat’ or ‘strongly’ disagreeing with the statement ‘I feel like I do not know how to interpret medical statistics’.

**Efficacy outcomes**

All participants indicated having seen or heard of the term ‘overdiagnosis’ before the workshop, although only 50% of free-text descriptions of overdiagnosis preworkshop were coded as correct. We observed an increase in overall knowledge from preworkshop to postworkshop, with knowledge increases observed for all 15 items, with the largest observed improvement in understanding the misleading nature of 5-year survival rates (see table 3 for all outcome measures at each time point).

**Acceptability of the workshop**

All participants agreed the workshop was relevant, something they would attend again and would recommend to other journalists (see figure 1). All participants agreed it would improve their reporting on medical tests, treatments and diagnoses and had increased their confidence with reporting on medical tests and treatments. Most agreed that the workshop was interactive, was interesting and kept their attention (see figure 1 for all acceptability outcomes).

In terms of workshop length, half of participants (n=4) indicated the workshop was just the right length, three participants indicated it was too short and one participant indicated it was too long. There was, however, high interest in a longer version, with three participants indicating interest in a longer 2-hour workshop and four participants in a longer 3–4 hours workshop. When asked how much of the information in the workshop was new, 1 indicated ‘none’, 5 indicated ‘some’ and 2 indicated ‘most’.

Analysis of free-text responses indicated that participants thought the workshop was relevant and interesting, with many valuing the opportunity to attend the workshop and appreciative of the interventions’ efforts to provide journalists with more support. A few raised the counterintuitive and confronting nature of the concept of overdiagnosis, and that the information was at times difficult to digest and would have benefited from further explanation and examples. A few described feeling the workshop was not interactive enough and two noted it ‘felt a bit rushed’. Participants’ suggestions for improvement included spending more time describing the concept and consequences of overdiagnosis, including more examples, more interaction and discussion, as well as preference for the workshop to be held face to face (see table 4 for illustrative quotes).

**Acceptability of the Tip Sheet and list of expert contacts**

All six respondents who responded to the 6-week survey indicated the workshop had informed their writing ‘a little’ (n=1) to ‘somewhat’ (n=5). Only two participants reported having written about new medical tests, treatments or diagnoses since the workshop. Two participants indicated they had used the Tip Sheet when writing, and one participant indicated having used the list of expert contacts. Three participants indicated they have not yet used the resources as they were on leave or had not written about a relevant topic (eg, ‘…I will certainly use it when required.’). Most gave positive feedback regarding both the Tip Sheet (‘Fantastic resource’, ‘Great layout—super easy to go through before/during writing’) and the list of expert contacts (‘Fine as is’). Suggestions for the Tip Sheet included to update it regularly.

Figure 1  Acceptability graph. Acceptability outcomes measured on a 5-point Likert scale (strongly disagree to strongly agree).
Learnings by research team
Recruitment of journalists was challenging. The 2 weeks lead up for advertisement and recruitment seemed too short notice for many journalists, while others reported not knowing until the day of the workshop if they were able to attend. This introduced challenges with the need to complete a preworkshop questionnaire before attending the workshop. Similar to participant feedback, the facilitators reported that the workshop felt too rushed for the amount of content covered, with not enough time to answer questions. Facilitators also perceived some participants’ difficulty grasping the concept of overdiagnosis. More case examples to clearly illustrate the unintended harms of an unnecessary diagnosis would be beneficial for understanding in future iterations.

DISCUSSION
This paper describes the development and feasibility testing of a novel training intervention for journalists in Australia. Piloting suggested that the multicomponent intervention is acceptable to journalists and may improve knowledge across several topics, including disease definitions, overdiagnosis and misleading statistics. Journalists were very interested, engaged and appreciative of receiving research training and support to improve critical reporting of new tests, treatments and diagnoses, and expressed a desire for further training.

Study results pointed to several strategies to improve the intervention to suit journalists with varying degrees of knowledge. Findings indicated journalists wanted more information and examples of overdiagnosis, as well as more time for group discussion. Facilitators also indicated there was not enough time to go through complex issues. Overdiagnosis is counterintuitive and challenging to both understand and communicate, particularly in light of strong beliefs in the benefits of early detection. Including more specific case studies and examples of overdiagnosis in future iterations may be helpful in conveying the unintended harms of an unnecessary diagnosis. Both participants and facilitators felt the workshop was too short, with most participants expressing interest in a longer version. This is in contrast to previous feedback from journalists about the ideal workshop length, with strong preferences for workshops of short duration (60 min) due to their limited availability and time constraints. Importantly, the successful Medicine in the Media workshops, run in the USA, were run over multiple days. In terms of examining the impact of the workshop, a few free text responses also indicated that the 6-week follow-up time frame was too short, as it had not been enough time for them to have written about a new test, diagnosis or treatment.

The study has important limitations as well as strengths. Gaining the attention of time poor journalists was a challenge and recruitment was difficult, particularly during COVID-19, when the pandemic remained a key focus for journalists covering healthcare. Employing additional recruitment channels and a longer lead time for recruitment may improve participation rates. In this context, the follow-up rate of 6/8 journalists at the time of the Omicron outbreak in Australia was a strong result reflecting the journalists’ engagement with the training and the study. As a feasibility study with short-term follow-up, we did not intend to detect significant differences in pre and post outcomes, but to provide insights into how the workshop and intervention materials can be optimised ahead

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Illustrative quotes from free-text responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key finding</strong></td>
<td><strong>Illustrative quote from participants in the pilot study</strong></td>
</tr>
<tr>
<td>Topics interesting and relevant</td>
<td>‘Really interesting info, from great experts who articulated the issues really well. Covered points that are very important to my role, and will assist my reporting’</td>
</tr>
<tr>
<td>Valued the opportunity to attend the workshop, appreciative of workshop goals</td>
<td>‘Great job pursuing this—you are on the right track. To reach journos who don’t already know this stuff will be hard because they won’t necessarily be interested’ ‘Grateful for the opportunity and happy to be involved further if needed’</td>
</tr>
<tr>
<td>Difficulty digesting concept of overdiagnosis, a counterintuitive and confronting topic</td>
<td>‘The idea that screening is good and early diagnosis is good is embedded into our culture. Challenging this idea with the excellent resources you provided in the workshop is confronting’ ‘I think you need to step people through the concept of overdiagnosis and how disease thresholds can be moved to get more people on treatment despite lack of evidence of benefits’</td>
</tr>
<tr>
<td>Desire for more interaction and discussion</td>
<td>‘There wasn’t enough time for questions, and journalists typically have many!’ ‘Perhaps some more interactive parts, like the press release exercise at the start’</td>
</tr>
<tr>
<td>Contrasting views re length of workshop</td>
<td>‘I’d suggest a full day and allowing more conversation among reporters’ ‘Lots more to discuss but realistically this is probably the time that people can dedicate to it. So, it’s about right’</td>
</tr>
<tr>
<td>Suggestions for improvement</td>
<td>‘It might be useful to have some advice from the journalists in your panel, if they have any, about how to ask the right questions (in an interview) to tease out potential bias and problems, and how to best include that information in a story.’ ‘Would obviously be great to do in person’ ‘The stuff about lead and length time bias was fascinating, and would really sink in better with more examples (which takes more time)’</td>
</tr>
</tbody>
</table>
of a randomised controlled trial. Strengths of the study include its novelty, because to our knowledge this is one of the first attempts to design and pilot an intervention to improve journalist reporting on the challenge of overdiagnosis. Although the sample is small, another of this study’s strengths is that it has provided useful data for planning a larger trial, and it achieved a diverse sample in terms of years of experience and across a number of media outlets. While participants self-reported how much the workshop had informed their reporting, we did not assess the impact of the intervention on actual medical reporting. This is an important direction for future research.

Improving the quality of medical reporting is a crucial endeavour given the powerful influence of the media on the public’s perceptions and usage of healthcare. This study is part of a global effort to offer journalists more training and support on these challenging issues. Such moves recognise the need to improve coverage of medical research but could be augmented by improvements in the quality of information provided by sources journalists rely on, such as press releases. Feasibility findings suggest that this intervention is acceptable to journalists and may improve knowledge across several important topics. The results of this acceptability pilot and ‘lessons learnt’ will inform the development of a randomised control trial to test the effectiveness of a revised intervention on the quality of journalists’ media coverage of medicine, with the overall aim of translating this programme into routine training for medical journalists.

Twitter Tessa Copp @TessaCopp

Acknowledgements We would like to thank Professor Rachelle Buchbinder for her help with facilitating the online workshop and all participating journalists. We would also like to thank Dr Mary O’Keeffe for multiple detailed discussions regarding study conceptualisation and design, for important preliminary work on all aspects of the intervention being piloted, and for leading key conferences which informed development of this intervention, including the cross-sectional study of media coverage of new tests, and the qualitative study with journalists.

Contributors RM conceived the study, with input from all coauthors, and MO’, as per acknowledgements. TC, TD, BN, LA, LM, KM, AB and RM were involved in designing the study and developing the methods. TC, RM and LM facilitated the workshop, as well as RB, as per acknowledgements. TC, BN, TD and RM contributed to the analysis. TC drafted the manuscript. TC, TD, BN, LA, LM, KM, AB and RM critically revised and approved the final manuscript. TC is the guarantor.

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Patient consent for publication Not applicable.

Ethics approval This study was approved by The University of Sydney Human Research Ethics Committee (protocol no: 2020/688). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

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REFERENCES
A short workshop for journalists about medical reporting

With a brief introduction by Liam Mannix, National Science Reporter, The Age, The SMH
Wiser Healthcare

• A research collaboration to reduce overdiagnosis and overtreatment

• Publicly funded, no ties to commercial organisations

• Media coverage of new tests, treatments and diagnoses is one of our research interests

www.wiserhealthcare.org.au
A short workshop for journalists about medical reporting

**Aim:** to help support journalists with their reporting of new medical tests, diagnoses and treatments

**What does it involve for you?**

1. Pre-workshop questionnaire

2. 1.5 hour workshop
   * Overview of overdiagnosis and key drivers
   * Strength of evidence and medical statistics to watch out for
   * Strategies to support journalists - tip sheet, list of expert contacts

3. Post-workshop questionnaire

4. 6-week follow-up questionnaire
Workshop outline

• What is overdiagnosis and what is driving it?

• Two key drivers of overdiagnosis:
  • Expanding disease definitions
  • Screening & early detection

• Conflicts of interest

• Study types & strength of evidence

• Misleading medical statistics

• Strategies to support journalists
Quick questions?
But first – A Quick Fun Exercise!

- As a group, quickly write a headline and first sentence for a press release about a new breakthrough medical test, in 5 minutes
- Then share and report back
What are some issues with this media headline and standfirst?

- No reference to harms
- Uses miracle language “holy grail”

Other issues with article:
- No reference to the GRAIL company who make the test and funded the study
- Coverage of a conference presentation – not a published, peer reviewed research article
What’s the problem?: Medical media coverage is often overly optimistic

- A substantial body of research shows that media coverage of medicine is often poor globally, due to three main issues:

  1. Tends to **overplay benefits** of tests and treatments

  2. Tends to **downplay or ignore harms** of tests and treatments

  3. **Often fails to disclose conflicts of interest** related to tests and treatments

  *Oxman et al, [Systematic Review of 44 studies] 2021*
Global Media Coverage of the Benefits and Harms of Early Detection Tests

Mary O’Keeffe, PhD1; Alexandra Barratt, MD2; Alice Fabbri, MD3,4; et al

Study of 1170 media stories about 5 tests targeted at the healthy, where there is a risk of overdiagnosis:

- Liquid biopsy for cancer
- 3D mammogram for breast cancer
- Apple Watch to detect heart problems
- Blood biomarker for dementia
- Artificial Intelligence test for dementia
Global Media Coverage of the Benefits and Harms of Early Detection Tests

Mary O’Keeffe, PhD; Alexandra Barratt, MD; Alice Fabbri, MD; et al.

Study results:

• Almost 100% of stories mentioned benefits of the test
• Two-thirds of stories made no mention of any potential harms
• The risk of overdiagnosis was only mentioned in 5% of stories
• Over half the stories included commentators with conflicts of interest, but only 12% of those stories disclosed that conflict
Potential strategies to support journalists

Results:

1. Workshops – like this one!
2. Tip sheets
3. Access to experts in overdiagnosis
Workshop outline

- What is overdiagnosis and what is driving it?
  - Two key drivers of overdiagnosis:
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    - Screening & early detection
  - Conflicts of interest
  - Study types & strength of evidence
  - Misleading medical statistics
- Strategies to support journalists
What is overdiagnosis?

- Overdiagnosis occurs when people are labelled with a technically correct diagnosis that does not improve their health outcomes – it’s an unnecessary diagnosis.

- The identification of deviations, abnormalities, risk factors, and pathologies that were never destined to cause harm.

- Overdiagnosis causes anxiety and other negative consequences of labelling, it brings side effects from unnecessary treatment, and wastes resources that could be better spent on genuine need.

*(Welch, Schwartz & Woloshin, 2011; Moynihan et al, BMJ 2012; Carter et al, BMJ 2015)*
Types of overdiagnosis

Overdiagnosis in asymptomatic people

- Use of sensitive testing technology to identify abnormalities in healthy people in the hope of preventing future disease

- Examples: cancer screening (mammography, PSA testing), atrial fibrillation screening (e.g. Apple Watch)

Overdiagnosis in symptomatic people

- Expanding disease definitions that either medicalise unpleasant ordinary life experiences or ‘cast the net too wide’ to include earlier/milder forms of symptoms

- Examples: Excessive sweating, polycystic ovary syndrome
### Some examples of conditions overdiagnosed

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate cancer</td>
<td>42% of prostate cancers in AUS overdiagnosed <em>(Glasziou MJA, 2020)</em></td>
</tr>
<tr>
<td>Breast cancer</td>
<td>~20% of cancers detected via screening in UK may be overdiagnosed <em>(Marmot Lancet, 2012)</em></td>
</tr>
<tr>
<td>Thyroid cancer</td>
<td>73% of thyroid cancers may be overdiagnosed in AUS <em>(Glasziou MJA, 2020)</em></td>
</tr>
<tr>
<td>Polycystic ovary syndrome</td>
<td>Controversial expansion of definition, more sensitive tests drive prevalence from ~10% to ~18% <em>(Skiba Hum Reprod, 2021; Copp BMJ, 2021)</em></td>
</tr>
<tr>
<td>Gestational Diabetes</td>
<td>Controversial expansion of definition in AUS, doubling or tripling prevalence, causing overdiagnosis <em>(Cundy BMJ, 2014)</em></td>
</tr>
<tr>
<td>High blood pressure</td>
<td>Controversial lowering of threshold in US, concern up to 80% of new diagnoses may be overdiagnosis <em>(Bell JAMA IM, 2018)</em></td>
</tr>
</tbody>
</table>
What drives overdiagnosis?

OVERDIAGNOSIS & RELATED OVERUSE
Mapping possible drivers to potential solutions

POSSIBLE DRIVERS

CULTURE
- Beliefs: eg more=better
- Faith in early diagnosis
- Intolerance of uncertainty
- Medicalisation
- Biased media reporting

HEALTH SYSTEM
- Financial incentives
- Expanding disease definitions
- Quality measures
- Complexity of care
- Guidelines
- Screening

INDUSTRY & TECHNOLOGY
- Industry promotion
- Diagnostic test sensitivity
- Medicine as a business
- Industry expands markets

PROFESSIONALS
- Fear of litigation
- Fear of missing disease
- Flaws in training
- Lack of confidence or knowledge
- Over-reliance on tests

PATIENTS & PUBLIC
- Over-reliance on tests
- Lack of confidence or knowledge
- Expectations clinicians will “do something”

POTENTIAL SOLUTIONS

CULTURE
- Awareness /information campaigns
- Health skepticism about early diagnosis
- Address uncertainty
- Improve media reporting

HEALTH SYSTEM
- Reform incentives from quantity to quality
- Reform disease definition
- Reform quality measures
- Reform guidelines
- Reform screening
- More research on OD & OU
- Multi-component interventions

INDUSTRY & TECHNOLOGY
- Better regulate promotion
- Better evaluation of tests
- Declare, reduce, exclude COIs
- Better evaluate disease definitions

PROFESSIONALS
- Reform litigation driver
- Comfort with uncertainty
- Educate and inform
- Interventions for providers
- Reduce test over-reliance

PATIENTS & PUBLIC
- Shared Decision Making
- Education/information campaigns
- Promote “doing nothing”


(Pathirana, Clark & Moynihan, BMJ 2017)
Workshop outline

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- Two key drivers of overdiagnosis:
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  - Screening & early detection
- Conflicts of interest
- Study types & strength of evidence
- Misleading medical statistics
- Strategies to support journalists
Expanding disease definitions

• Expanding disease definitions and changing diagnostic thresholds are a key driver of overdiagnosis

• Happens when the line between normal and abnormal is shifted to include milder and earlier forms of disease, often driven by belief that an earlier diagnosis will prevent harm and improve outcomes in long run

• BUT – expansion often occurs without evidence that doing so will help people live longer or feel better

(Welch, Schwartz & Woloshin, 2011; Broderson et al, BMJ Evid Based Med 2018)
Example of expanded definition: Gestational Diabetes

• One study found the changed definition of gestational diabetes doubled the number of pregnant women diagnosed, from 10% under the old criteria to almost 20% under the new one (Sexton et al., 2018)

• Although the changes aimed to reduce adverse pregnancy outcomes, no reductions in adverse outcomes for mother and child were observed (Sexton et al., 2018)

• This suggests limited benefit of the expanded definition – but real harms, such as psychological impact of labelling, and resources wasted caring for additional women diagnosed (Cade et al., 2019)
Who determines the definition of disease?
Disease definition panels

• The decision about diagnostic cut offs between normal and abnormal are often set by consensus discussions among expert panels of clinicians, sometimes arbitrarily.

• Although decisions should be based on evidence, they can also involve value judgements, and panels members sometimes have intellectual biases or financial conflicts with companies which stand to benefit from more people being labelled as having a disease.

• This increases the risk of the potential benefits of an expanded definition being overestimated, whilst the potential harms may be underestimated.

*(Doust et al, JAMA Intern Med 2017; Moynihan et al, BMJ Evid Based Med 2019)*
Workshop outline

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- Study types & strength of evidence
- Misleading medical statistics
- Strategies to support journalists
Screening tests and early detection

• What is a screening test?

• Screening is done in asymptomatic people such as a woman who is well, has no breast lumps or symptoms, and goes for a mammogram

• Can occur in healthy people (mass screening, shopping centre) or when an individual visits the doctor

• Screening is only effective if early treatment improves prognosis. Contrary to popular belief, early detection is not always a good thing

(Welch, Schwartz & Woloshin, 2011)
Other instances of overdiagnosis

- People with minor symptoms (low back pain, knee pain, shoulder pain) receive unnecessary tests that pick up age-related or incidental findings

- ‘New’ diseases or ‘medicalising’ normal (sarcopenia, pre-obesity)

- Labelling risk factors as diseases in their own right (thin bones or osteopenia or ‘pre-fracture’)

Buchbinder R, Harris I, Hippocrasy: How doctors are betraying their oath.
Quick questions or comments?
Workshop outline

• What is overdiagnosis and what is driving it?

• Two key drivers of overdiagnosis:
  • Expanding disease definitions
  • Screening & early detection

• Conflicts of interest

• Study types & strength of evidence

• Misleading medical statistics

• Strategies to support journalists
How common are conflicts of interest and why do they matter?
Conflicts of interest: widespread across medicine

Extensive industry influence in medicine may be jeopardising...

...“the integrity of scientific investigations, the objectivity of medical education, the quality of patient care, and the public’s trust in medicine.”
Conflicts of interest: expanding disease definitions

Expanding Disease Definitions in Guidelines and Expert Panel Ties to Industry: A Cross-sectional Study of Common Conditions in the United States

Raymond N. Moynihan¹*, Georgia P. E. Cooke¹, Jenny A. Doust¹, Lisa Bero², Suzanne Hill³, Paul P. Glasziou¹

- World-first study investigated recent changes to definitions for 14 common conditions and diseases in the US
- Most panels proposed expanded definitions that increased the number of people considered to have the disease
- No panel reported rigorous assessment of the potential harms of that expansion
- Most panels had a majority of members with financial ties to pharmaceutical companies
Conflicts of interest: widespread across medical research

Large-Scale Assessment of a Smartwatch to Identify Atrial Fibrillation

- NEJM study generated much media about benefits of Apple Watch
- **19 of 22 authors of the NEJM trial** examining the ability of the Apple Watch to detect atrial fibrillation reported grants or personal fees from Apple in the publication
- Media stories often failed to report this conflict of interest
Media coverage: conflicts often not disclosed

LESS IS MORE

Global Media Coverage of the Benefits and Harms of Early Detection Tests

Mary O’Keeffe, PhD¹; Alexandra Barratt, MD²; Alice Fabbri, MD³,⁴; Joshua R. Zadro, PhD¹; Giovanni E. Ferreira, PhD¹;
Sweekriti Sharma, MPH¹; Ray N. Moynihan, PhD⁵

JAMA Internal Medicine


Conflict of interest Disclosed conflicts

Early detection test

<table>
<thead>
<tr>
<th>Early detection test</th>
<th>Media stories, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>58</td>
</tr>
<tr>
<td>Liquid biopsy</td>
<td>97</td>
</tr>
<tr>
<td>3-D mammography</td>
<td>54</td>
</tr>
<tr>
<td>Apple Watch</td>
<td>39</td>
</tr>
<tr>
<td>Blood biomarker tests</td>
<td>62</td>
</tr>
<tr>
<td>Artificial intelligence</td>
<td>46</td>
</tr>
</tbody>
</table>
Workshop outline

- What is overdiagnosis and what is driving it?
- Two key drivers of overdiagnosis:
  - Expanding disease definitions
  - Screening & early detection
- Conflicts of interest
- Study types & strength of evidence
- Misleading medical statistics
- Strategies to support journalists
Strength of evidence – things to consider

1. What is the study design?
   - The evidence-based medicine pyramid

2. Are the findings preliminary? Has it undergone peer review?
   - Research abstract or presentation at a scientific meeting → what is new may turn out to be wrong
   - Peer reviewed → evaluated by scientific community

(Schwartz & Woloshin, Annals of Internal Medicine 2004)
Strength of evidence: Study types

Evidence-based medicine pyramid (Bass, 2013)
Study types: Randomised controlled trials (RCTs)

- People are allocated to groups at random (e.g. flipping a coin)

- ‘Gold standard’ – most reliable, robust research design
  - Eliminates selection bias
  - Balances known & unknown confounding factors
  - Best way to see if it works and is safe

- Not always possible or ethical (e.g. studying effects of smoking)

Evidence-based medicine pyramid (Bass, 2013)
Cautionary tale: The case of Hormone Replacement Therapy (HRT)

- In 1980s and 1990s long-term HRT was marketed to women as a wonder drug to reduce risk of fracture, heart disease, cognitive decline, and more

- Evidence supporting these claims was primarily from observational studies

- In 2002, 1\textsuperscript{st} big randomized controlled trial with 16 000 women (Rossouw et al, JAMA, 2002)

- Found HRT harms outweighed benefits:
  - Only tiny reduction in risk of fracture and colon cancer
  - Increased risks of heart attack, stroke, blood clots, breast cancer and probable dementia – led to massive drop in usage (Haas et al, Annals of Internal Medicine, 2004)
Study types: Systematic reviews

- Systematic reviews are summaries of all available studies - often restricted to best evidence or RCTs

- Individual RCTs combined in a meta-analysis to give an overall result

- Includes a critical appraisal of the quality of the included studies

- Can be very time consuming, requires training and skills
Strength of evidence: Beware preliminary findings

- A study by Schwartz et al (2002) found abstracts at scientific meetings receive substantial attention in the high-profile media, but many studies remained unpublished around 3 years post-meeting (Schwartz et al, JAMA 2002)

- Preliminary results can also change → promising reports often fail to pan out, and methods, results and interpretations change over time

- The rise and rise of pre-prints → likely to have similar issues
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• Strategies to support journalists
Misleading medical statistics to avoid

1. Absolute versus relative risks

2. Screening tests - misleading statistics and biases
   a. Survival rates
   b. Lead time bias
   c. Length time bias
Relative or absolute?

- A great new drug cuts the risk of getting a disease by 50%

- 50% of what?
Beware exaggerating benefits

Bone drugs cut hip fractures by 50%

50% Reduction in Risk

<table>
<thead>
<tr>
<th>Placebo</th>
<th>Osteoporosis Drug</th>
</tr>
</thead>
</table>
Beware exaggerating benefits

Benefits of osteoporosis drug in reducing hip fractures

**Relative Framing:**
50% Reduction in Risk

**Absolute Framing:**
1% Reduction in Risk

![Diagram showing relative and absolute framing of osteoporosis drug effectiveness.](image-url)
Relative vs absolute terms

- Giving the *relative* risk reduction without baseline or *absolute* risk is common in media stories, but can *mislead* by exaggerating benefits
- What does a 50% relative risk reduction actually mean?
  - A medication that lowers risk of disease from 20% to 10%
  - Or a medication that lowers it from 0.02% to 0.01%
- Both of these are a 50% relative risk reduction – yet may differ dramatically in clinical importance

*(Schwartz & Woloshin, Annals of Internal Medicine 2004)*
Misleading medical statistics to avoid

1. Absolute versus relative risks

2. Screening tests - misleading statistics and biases
   a. Survival rates
   b. Lead time bias
   c. Length time bias
Screening tests: misleading statistics and biases

• When evaluating screening effectiveness, there is one key statistic to be wary of, particularly in observational studies → survival rates

• Survival time is the period between diagnosis and death

• If survival rates rise following screening, does that mean screening is effective?
Remarkable improvements in breast cancer survival since BreastScreen began in Vic 20 years ago. ow.ly/Dg13D

NSW Cancer Council director of cancer programs Kathy Chapman said breast cancer had a 90 per cent chance of survival five years after diagnosis, compared to 72 per cent 30 years ago.

EARLY DETECTION IS BETTER BECAUSE:

- the earlier you detect breast cancer the better your chance of beating it
- it means less invasive, more effective treatment
- with early detection and treatment, nine out of 10 women survive.

Source: Australian Institute of Health and Welfare

Breast Cancer Network Australia welcomes a government report that confirms the number of women surviving breast cancer has continued to increase over the past thirty years.

Between 1982 and 1987, 72 per cent of women diagnosed with breast cancer were expected to survive more than five years. This increased to 90 per cent of women diagnosed in 2010.
Survival rates → lead time bias

What does longer survival mean?

We assume it means delayed death

But it may just mean earlier diagnosis
Lead time bias

- Lead time bias: Early detection with no improvement in outcome; more diagnosis time not more lifetime; people die at the same time, but live longer knowing they have the disease.

- One reason why early detection looks good even if it is worthless.

- Can be avoided by using mortality as the primary outcome (NOT survival).

(Gigerenzer et al, Psychological Science in the Public Interest, 2007)
Length time/ Overdiagnosis bias

SCREENING DETECTS CANCER

DEATH

SYMPTOMS

THIS IS WHEN OVERDIAGNOSIS OCCURS

Adapted from a figure courtesy of H. Gilbert Welch, Dartmouth Medical School
Length Time/ overdiagnosis bias

- Length time bias: The tendency of screening to preferentially detect slowly progressive & nonprogressive disease

- Another reason why survival rates are misleading and should be avoided

- Only use mortality rates and evidence from randomized controlled trials to evaluate screening effectiveness
Korea's thyroid cancer ‘epidemic’ is a cautionary tale about how screening can harm and lead to overdiagnosis

Thyroid-Cancer Incidence and Related Mortality in South Korea, 1993–2011.

Data on incidence are from the Cancer Incidence Database, Korean Central Cancer Registry; data on mortality are from the Cause of Death Database, Statistics Korea. All data are age-adjusted to the South Korean standard population.

(Ahn et al, NEJM 2014)
The cervical screening program in Australia is a public health success story demonstrating effective screening.

Figure. Age-standardised cervical cancer incidence & mortality rates

Questions?
Overdiagnosis not just an issue with cancer screening tests
Some have introduced “digital pre-diagnostic tools” to evaluate a woman’s “risk” of PCOS

Shift from simply quantifying consumers health data to medicalizing it

Unclear and questionable accuracy of the health risk assessment

“Your symptoms may indicate a hormonal imbalance which is probably a manifestation of PCOS”
Flo’s PCOS Health Assistant tool

PCOS Awareness Month at Flo

248,000 women became aware that the logged signs should be discussed with a doctor

4,3M users saw the information about PCOS in the app

636,000 users took PCOS self-assessment in the app

26 DAYS PCOS Health Assistant was available for all the Flo users in English

- irregular cycle
- hirsutism
- acne
- excessive hair loss
- hyperpigmentation

The most widespread symptoms that could indicate an increased risk of PCOS

39% labelled “high risk” of PCOS

http://flo.health/pcos/awareness-month-results
An example of high quality reporting

**The New York Times**

*Period-Tracking Apps Say You May Have a Disorder. What if They’re Wrong?*

By *Natasha Singer*

Oct. 27, 2019

“But what many women may not have known is that the apps did not conduct high-level clinical studies to determine the accuracy of their health risk assessments or the potential for unintended consequences such as overdiagnosis.”

“...The new tools could lead some women to be labeled with a hormonal imbalance they did not have or that may have no significant repercussions for their health.”
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- Misleading medical statistics
- Strategies to support journalists
Potential strategies to support journalists

1. Workshops
2. Tip sheets
3. Access to experts in overdiagnosis
Five short questions to consider when reporting on tests, treatments, and diagnoses

1. What are the potential benefits of this test or treatment?

2. What are the potential harms of this test or treatment?

3. Has the disease or condition been expanded, bringing a risk people are overdiagnosed?

4. Are there conflicts of interest among those promoting the test, treatment, or diagnosis?

5. What levels of evidence support the claims being made about a test or treatment?
A short tipsheet for better reporting of tests, treatments, and diagnoses

Here are 5 simple questions, or tips, to consider when writing health stories. They’re not intended as strict guidance, but a list of some key things to think about and perhaps discuss with a range of contacts, including researchers who are independent from whoever is promoting a new test or treatment. They have arisen from evidence that media stories often tend to overplay benefits, play down harms and ignore important conflicts of interest. Consideration of these questions may lead a reporter’s research in unexpected directions.

1. What are the potential benefits of this test or treatment?
   It's valuable to routinely ask whether benefits might be overplayed in any way, for example by statistics presented in relative rather than absolute terms, or using weaker surrogate outcomes, rather than outcomes that are important to people. Great care is needed to avoid miracle language that hyps tests or treatments and creates false hope.

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   Many diseases have been expanded, labelling more people with very mild problems or at very low risk of future illness. Many of those newly labelled people may be overdiagnosed, meaning the label will bring them more harm than good (e.g. being unnecessarily treated).

4. Are there conflicts of interest among those promoting the test, treatment, or diagnosis?
   There is strong evidence that financial conflicts of interest can distort medical research, education and practice. It's considered vital that important conflicts of interest are reported, such as sponsorship of studies or payments to researchers. Routinely seeking independent views is also recommended.

5. What levels of evidence support the claims being made about a test or treatment?
   It's valuable to inform people about the strength of the evidence behind a claim about a test or treatment. Questions to consider include: Is the evidence from a press release? Is the data interim or final? Is it from a pre-print or peer-reviewed? Is it from a single study or a systematic review of all studies? What was the sample size? Is it human or animal? How does it compare to other available evidence?

For more information on each tip, scan the QR code or go to: www.wiserhealthcare.org.au

Wiser Healthcare is a NHMRC-funded Australian research collaboration.
# List of expert contacts

## Health and medicine contacts – with expertise on overdiagnosis and overuse of tests and treatments

Not any of the below? Contact wiser.healthcare@sydney.edu.au to find the right expert

<table>
<thead>
<tr>
<th>Expert</th>
<th>Areas of special interest*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prof Alex Barratt</strong> • <a href="mailto:alexandra.barratt@sydney.edu.au">alexandra.barratt@sydney.edu.au</a> •</td>
<td>Breast and prostate cancer overdiagnosis, carbon footprint of healthcare</td>
</tr>
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<td><strong>Prof Paul Glasziou</strong> • <a href="mailto:pglaszio@bond.edu.au">pglaszio@bond.edu.au</a> •</td>
<td>Cancer, cardiovascular disease, general practice</td>
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<td>Cancer, cardiovascular disease</td>
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<td>Cancer communication and decision making</td>
</tr>
<tr>
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<td>Back pain, physiotherapy</td>
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<tr>
<td><strong>Prof Ian Harris</strong> • <a href="mailto:ianharris@unsw.edu.au">ianharris@unsw.edu.au</a> •</td>
<td>Orthopaedic surgery, spine surgery</td>
</tr>
<tr>
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<td>General practice, women's health</td>
</tr>
<tr>
<td><strong>Dr Tessa Copp</strong> • <a href="mailto:tessa.copp@sydney.edu.au">tessa.copp@sydney.edu.au</a> •</td>
<td>Women’s reproductive health</td>
</tr>
<tr>
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<tr>
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<td>Health communication and behaviour change, health literacy</td>
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<tr>
<td><strong>Dr Carissa Bonner</strong> • <a href="mailto:carissa.bonner@sydney.edu.au">carissa.bonner@sydney.edu.au</a> •</td>
<td>Heart disease prevention, risk communication</td>
</tr>
<tr>
<td><strong>Prof Chris Semsarian</strong> • <a href="mailto:c.semsarian@centenary.org.au">c.semsarian@centenary.org.au</a> •</td>
<td>Cardiovascular conditions, genetics</td>
</tr>
<tr>
<td><strong>A/Prof Ray Moynihan</strong> • <a href="mailto:rmoyniha@bond.edu.au">rmoyniha@bond.edu.au</a> •</td>
<td>Medicine in the media, conflicts of interest</td>
</tr>
<tr>
<td><strong>A/Prof Denise O’Connor</strong> • <a href="mailto:denise.oconnor@monash.edu">denise.oconnor@monash.edu</a> •</td>
<td>Research translation/implementation science</td>
</tr>
</tbody>
</table>

*Areas of expertise not limited to special interests listed
Questions?
Conclusion

We hope this workshop, tip sheet and list of expert contacts will help you with:

1. Realistic reporting of **benefits** of tests and treatments

2. Routine reporting of potential **harms** of tests and treatments

3. Regularly reporting **conflicts of interest** related to tests, diagnoses and treatments
Please complete post-workshop feedback questionnaire


Thank you!
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