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Misguided cancer goal

An influential US advocacy group has set a deadline to beat breast cancer by 2020. But it puts public trust at risk by promising an objective that science cannot yet deliver.

Hope is not a good strategy, in life or in disease research. So the setting of goals, and the drive to reach them, is to be commended, and cancer is no exception. But a 2020 deadline for 'ending' breast cancer that former US President Bill Clinton endorsed earlier this month is misguided. Like other 'beat cancer' deadlines that are regularly floated, it is potentially harmful to the public trust that underpins the whole research enterprise, not to mention to the patients who understandably cling to hope, whatever its validity.

Clinton, who lost his mother to breast cancer, has become honorary chairman of a two-year-old campaign by the National Breast Cancer Coalition, which declares on its website that it has "One Mission: To End Breast Cancer by January 1, 2020". The advocacy and research-funding organization, based in Washington DC, adds that it has a "strategic plan" to achieve that mission, by focusing on prevention and on eliminating the metastatic form of the disease, which is what kills.

The coalition provides a 4.5-page "blueprint" that is long on aspiration and short on scientific detail. For instance, it declares that by 2020 "we must understand how to prevent people from getting breast cancer in the first place". This goal leans heavily on the development of a preventive breast-cancer vaccine. A research plan for this is said to be "in place" and will serve as a model for other, "catalytic projects". These could include exploiting the role of viruses and inflammation in breast cancer, and targeting the immune system to prevent metastasis.

Ambitious goals are perfectly defensible, and indeed desirable, when we have the means to achieve them. The campaign to eradicate smallpox made eminent sense once a vaccine was ready, as does the goal of eliminating polio. Yet the thorny problems of finishing off even polio, for which we have had a vaccine for nearly 60 years, provide a cautionary tale about the advisability of setting out to eliminate any disease.

This is particularly true of the myriad diseases we collectively call cancer, the complexities of which we have scarcely begun to fathom. Consider just one study, published earlier this year (P. J. Stephens *et al. Nature* **486,** 400–404; 2012), which analysed protein-coding genes in breast cancers from 100 different women and found no fewer than 40 different mutational drivers of the disease. These were found in 73 different combinations in the 100 patients, who each had between one and six mutations. The low-hanging fruit here is scarce: only 28 of the patients harboured just one mutation, and finding a targeted therapy for even these single-mutation cases will be a daunting task.

Added to that is the disease's intractability. It cannot be banished like smallpox; our biologies are by definition vulnerable to a disease that has infinite manifestations profoundly rooted in our genetics. Even if a panoply of promising therapies were available, the eight to ten years it takes to complete a clinical trial makes a 2020 deadline impossible. As for prevention, truly valuable trials require not years but decades, because of the various influences on breast-cancer development during a lifetime. Britain's Breakthrough Generations Study, which recruited its 100,000th participant in 2009, anticipates running for 40 years.

The National Breast Cancer Coalition counters that such arguments cater to those content with the status quo — what the coalition sees as the drift of a research enterprise that, after decades of investment, is not motivated by sufficient urgency. On the contrary: we are all for urgency, but in the service of goals that are within the realms of possibility.

Here are a few. Set out to identify all tumours in which the *HER2* gene is mutated and treat them with the drug Herceptin (trastuzumab) by 2020. The treatment is known to work for this genetic category of the disease, so this is not inconceivable. Or declare that in five years, we will have developed several robust breast-cancer models that could rapidly be deployed to evaluate the functional significance of the mutations and polymorphisms that genomics is uncovering at a breathtaking rate. A project such as this, with finite parameters and price tag, can be pegged to an achievable time frame.

"Discovery does not answer to deadlines."

Or, tackle another cancer afflicting women by campaigning to overcome the apathy with which the human papillomavirus vaccine has been greeted in the United States. Universal vaccination of 11- and 12-year-old girls against the cervical-cancer-causing virus would, at a stroke, provide huge gains against the roughly 4,000 deaths and 12,000 new cases of this cancer that are seen in the United States each year.

Discovery does not answer to deadlines, and campaigns that pretend that it does risk wasting public trust, whether from the taxpayers who support the US National Institutes of Health or from the millions of donors who give to dozens of disease-advocacy groups. There is a fine line between creating a sense of urgency and promising too much; it is best to stay on the side of the line that is realistic about how science works, and about what is currently achievable. ■

A way to buy time

With climate talks inching along, gains in energy efficiency could slow the rise in emissions.

This week and next, diplomats from around the world gather once again to discuss global warming. With commitments under the Kyoto Protocol ending this year (see page 653), one key goal of the United Nations meeting in Doha is to make progress towards the 2015 signing of a new global climate treaty, to take effect by 2020. The world is on track for a temperature increase of up to 4 °C by the end of the century, but the UN hopes to limit that to just 2 °C.

Unfortunately, diplomacy and global warming operate on incompatible schedules. An eight-year wait for action would seem to put the