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N. Oudshoorn
Resilient Cyborgs. Living and Dying with Pacemakers and Defibrillators, London, Palgrave Macmillan, 2020, pp. 350

Veronica Moretti *Università di Bologna*

Providing an autonomous review of a medical book during a moment in history when the ubiquitous COVID-19 pandemic progressively has reshaped the imagined future of health and illness has been a challenging task. Other diseases look anachronistic. Nelly Oudshoorn's book *Resilient Cyborg* is a strong call to the "COVID-aside reality", telling us how some people are living and dying with pacemakers and defibrillators, which are intrusive technologies surgically implanted in patients' bodies. Pacemakers and defibrillators have changed radically over the past few decades (the first prototype for a pacemaker was introduced in 1985), considering that at the beginning, they were used only for patients who had survived cardiac arrest. Nowadays, these medical devices transform subjects into "mundane cyborgs".

The book's core argument is that people living with defibrillators and pacemakers are far from being passive entities. With a strong empirical focus, the volume takes the reader on a journey inside and outside what the author calls "everyday cyborg bodies" (p. 17).

Oudshoorn's book is structured around four main parts ("Introduction: theorising the resilience of hybrid bodies"; "Technogeographies of resilience"; "Resilience and difference"; and "How hybrid bodies fall apart").

The first part (Chapters 1-2) theorises on the resilience of hybrid bodies, a concept that has inspired many STS scholars (but not exclusively) to

address human-technology relations, resulting in extensive cyborg literature (Haraway 1991; Mol 2002). Everyday cyborgs must live persistently and inseparably with technology implanted inside their bodies – but with an expiration date. Considering that these devices' batteries last approximately 5-10 years, many people must undergo several implantations throughout their lives. Controlling the battery's lifetime is "crucial because heart devices fail to work when the battery is weak or empty" (p. 69). Therefore, battery life also must be taken into account.

Like bodies, technologies can fail. This topic is examined to illustrate how pacemakers and defibrillators not only can save lives, but also introduce new vulnerabilities. The vulnerability of an everyday cyborgs is not something isolated. On the contrary, it is embedded in a network of relations of human and non-human actors, including relatives, healthcare professionals, biomedical technologies and socio-technical environments. Vulnerability should not be considered only through its negative connotations, as it can create awareness of technological systems' fragility and contribute to learning and coping with potential technological risks. This is how Nelly Oudshoorn adopts the resilience perspective – something that is not given (far from being static) and always a "work in progress" (p. 44).

The second part of the book (Chapters 3-5) provides the reader with variety of sources through which to follow the author in her narrative. The empirical data are derived from observations of 10 pacemaker/ICD (Internal Cardioverter Defibrillator) control visits, semi-structured interviews with patients and healthcare professionals, analysis on different online communities and articles on the security problems of pacemakers.

Oudshoorn presents the concept of techno-geographies of resilience to explain how responsibilities – in terms of equity in the dominant Western health care system – are distributed differently between actors and spaces. They are geographically situated. Pacemakers and defibrillators might appear to be isolated pieces of equipment that work automatically, but they cannot be separated from local infrastructures because technologies participate in redefining the meaning and practices of the spaces in which they are used. At the same time, people *somatically wearing* these devices are not invisible and inactive. More specifically, this part of the book describes the monitoring and surveillance trajectory, including follow-up visits, and it opens up the discussion to a major topic: vulnerabilities of patients who must learn how to cope with different aspects of the implants. As mentioned above, despite its promises, technology can arise and introduce new vulnerabilities that make some ordinary activities difficult or even impractical, such as air travel, working in a context full of machinery or simply using everyday consumer electrical devices. Even the intimate sphere with a partner can require alterations. Basically, a traditional safe place (home) or a leisure activity can endanger these patients. Such vulnerabilities can lead to a particular kind of 'existential uncertainty' in the (re)construction

of a new identity because of this double fragility of the body and the technology.

In the third part (Chapters 6-7), Oudshoorn demonstrates socio-demographic variables' pivotal role in becoming a resilient cyborg. In particular, the author adopts an intersectional approach – that is the combination of a person's multiple characteristics to explain discrimination and forms of oppression – to uncover dynamics that can shape vulnerability and resilience. Unflinchingly, the author discloses how gender and age matter in the world of heart-wired cyborgs. Bearing in mind that most people who receive these devices are white adult men, pacemakers and defibrillators may not fit other bodies easily. Gender is involved when the author describes mismatches between devices and bodies in the Western cultural ideal of femininity and beauty. Surgical scars make the disease visible, but these scars imply much more than an aesthetic defect; they imply a "drastic change in the ways in which women relate to their bodies and to others (p. 156)". The "gaze of others" (p. 155 and p. 178) matters even more for women because their bodies are more subject to inspecting gazes than male bodies. However, some women may resist these cultural norms by showing off their scars publicly and articulating new forms of normalcy.

Age is another crucial variable, as these medical devices can affect younger and elderly people's lives differently. Young people may receive these implants because of genetic predisposition for life-threatening heart-rhythm disturbances. In this sense, the genetic diagnosis of a predisposition might become a *family-disease*, i.e. the person is a sort of *cyborg-in waiting*. However, older people are more likely to receive these implantations to prevent sudden cardiac arrest or to treat heart failure.

In this regard, anxiety is knowledgeable in different forms of emotional work. Because they have not experienced any prior cardiac problems, children or young adults have the dilemma of deciding whether or not to continue using these medical devices, balancing the "risk of lifelong implant against the consequences of not putting in a new defibrillator, which can be more devastating, particularly if the medication fails to work" (p. 199). Cardiac arrest survivors, who often are elderly, experience high stress, anxiety and depression levels, especially during the first six months after being discharged from the hospital.

The last part of the book (Chapters 8-10) takes a strong stance, highlighting the ambivalent and intricate life cycle of wired-heart cyborgs, with a specific focus on what actually happens when they face end of life. In this sense, it is significant to examine how technologies affect how people cope with dying and death. To keep these hybrid bodies alive, it is important that patients with these implants feel the active presence of and engage with their close relatives, technicians, nurses and other professionals. Just as an everyday wired cyborg's life differs from those who do not use these devices, in the same way, the passage from life to death is not the same for wired-heart cyborgs as it is for people living without internal heart devices.

The widespread use of life-extending technologies has created several ethical dilemmas, as they generate responsibilities ("Will a medical intervention prolong the life of a patient or contribute to a prolonged, unwanted way of living and dying?" p. 232) that did not exist before the surgical implantation. Basically, pacemakers and defibrillators orient "dying trajectories" (p. 230), influencing the perception of and expectations tied to dying.

This book can act as a thought-provoking work for different scholars in getting closer to a complex theme. The merging of humans with technology is a classical topic supported by a rich STS vocabulary, including words as cyborgs, entanglement, human-machine unions and incorporation.

Following recent STS scholars (Pinch and Bujstervard 2012), it is relevant to ask how people living with internal heart devices use their sensory experiences as a new resource to make sense of their transformed bodies. Patients play an active role in managing and shaping the care they receive, doing many tasks that actually are not seen, a sort of "invisible work" (Strauss et al. 1997). Additionally, this book sheds light on the full circle of hybrid bodies, from how technologies transform human life, to contribute to postpone death and fall apart. The death of technologies largely is neglected in the sociology of technology, as studies focus more on how technology exists and shapes our lives, not how it ends.

Future studies possibly could broaden research on disparities in accessing to these medical devices, as well as expand understanding on how to become a resilient cyborg. Additionally, the book does not address other differences, such as ethnicity and disability – an aspect that the author admits. More emphasis on other variables that are strong predictors of health outcomes, e.g., education level and income – which are actually part of the intersectional approach (Kaufman 2010) – could have grounded Oudshoorn's analysis on a more solid basis. The intersectional approach may provide an important heuristic for grasping the multiple differences on building resilience.

At the end of the book, the author proposes a *sociology of resilient cyborgs*. Like all lay people, resilient cyborgs gain knowledge and skills in different ways through a constant process. They learn what it means to live with their implants in their daily lives, including monitoring practices within the clinical environment.

To paraphrase Simone de Beauvoir: one is not born, but rather becomes a cyborg.

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G. Tipaldo
La societa' della pseudoscienza. Orientarsi tra buone e cattive spiegazioni [The Pseudo-Science Society. How to navigate among good and bad explanations], Bologna, il Mulino, 2019, pp. 311

Maria Carmela Agodi *Univesità degli Studi di Napoli Federico II*

The red thread running through this book is the idea that sociotechnical controversies – where scientific and pseudoscientific knowledge claims are clashing in the public sphere – follow a typical causal structure. Such a structure makes recent oppositions to vaccines or beliefs in alternative cancer therapies very similar to local conflicts against big infrastructures – those well-known as exemplars of the so-called NIMBY (Not In My Back Yard) or BANANA (Build Absolutely Nothing Anywhere Near Anything – or Anybody) syndromes.

According to Tipaldo, while commonalities prevail, two features distinguish more recent controversies from NIMBY and BANANA conflicts. The first distinguishing feature concerns the issues at stake. Issues at stake in NIMBY used to be undesired land uses (LULU, Locally Undesired Land Uses, is actually a more neutral acronym than NIMBY to identify them); recent controversies are mainly focused on collective decisions affecting individual personal bodies – through public regulation/intervention about health, food, personal habits. "Not in my body" (NIMBO) is the best-suited synthesis for them.

The second distinguishing feature concerns the role played by science. In NIMBY or BANANA controversies, scientists used to play a secondary role and they only came on stage when called by public administrators and politicians to support their own decisions. In recent technoscientific controversies, instead, scientific experts are positioned at the center of the stage – as sharing with governmental bodies the responsibility of public decisions – while opponents support the so-called fake scientific