underline the need for systems biology approaches in ovarian cancer research. It is a common fallacy to infer from documentation of differing microbiota that restoration of eubiosis (if possible) will affect disease onset or course. Overall, there is no direct evidence that the human microbiota has a key role in cancer causation, but the microbiota needs to be taken into account in future research.[1] The challenging but essential task now is to seek confirmation in related studies, and to elucidate how host genetic, epigenetic, microbiota, reproductive, lifestyle, and other environmental factors converge in ovarian neoplasia, a highly heterogeneous disease.[9]

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Cancer and night shift work: what we still do not know and why

The International Agency for Research on Cancer (IARC) have categorised night shift work as probably carcinogenic to humans.[1] This news is potentially concerning—but what does this assessment mean and, perhaps more importantly, what does it not mean?

Like all such IARC categorisations, it tells us nothing at all about the actual risks to night shift workers. The assessments weigh up the strength of evidence that there could be a potential risk under certain circumstances. Whether in practice there is an actual risk, and if so, how big that risk is, is something that the IARC does not consider in deciding the category. This distinction is made clear in the Q&A document[2] that they released. Their conclusion is that night shift work probably can increase the risk of cancer in humans under certain circumstances—that is exactly what they mean by "probably carcinogenic to humans". But they do not state which circumstances or how much increased risk. And, because they say "probably", there remains a possibility that shift work cannot affect human cancer risk at all.

The classifications that IARC uses for things that potentially could cause cancer are broad. They have just four categories for everything they investigate. The "probably" category currently contains 82 different

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agents, including the rocket fuel hydrazine and the burning of wood fuel in the home. These examples illustrate how far this classification is from defining the detailed real-world risks. Rocket-testing workers can be exposed to hydrazine, but most of us will never come upon it. And the risk from your wood-burning stove clearly depends in a complicated way on the wood, the stove, and how much you use it.

The remaining doubt on shift working is largely because clear evidence in humans is very hard to obtain. There is good evidence, IARC conclude, that interfering with rhythms of light and dark in experimental animals can increase the probability of cancer, and indeed on how these changes occur. But do things work in the same way in humans? There are inconsistencies in the evidence. It is not ethical or feasible to carry out long-term experiments in humans, so instead researchers observe people, and record their working patterns and cancer diagnoses. Unavoidably, there are many possible biases in such studies. Perhaps the people studied are not typical, or their work records were inaccurate. Also, people who work shifts differ from those who do not in many ways, and perhaps these other differences are the real cause of any increase in cancer risk.

The IARC assessment, "probably carcinogenic in humans", has not changed since they last considered shift working in 2007. They have certainly considered much new evidence; all but one of their references describe work published since 2007. But the new evidence from human studies still has unavoidable inconsistencies and potential biases. Future research might make things clearer, but that will not be easy.

Should you be concerned by this classification if you work night shifts? IARC have left open the possibility that shift working has no effect at all on cancer risk. If it has, the evidence on the size of any risk is not clear. If the risks were really substantial, the research results in humans could well have been clearer and more consistent. My feeling is that this should not be a major worry for night shift workers.

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Improving affordability of new Essential Cancer Medicines

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Effective cancer care requires investment in health infrastructure, a trained health workforce, and quality-assured, affordable medicines within a sustainable supply chain. To this end, in a major move to increase access to cancer medicines in low-income and middle-income countries (LMICs), WHO has added ten new cancer therapies to its 21st Model List of Essential Medicines.[1] When WHO labels medicines as essential, it means that they have proven their utility and should be available and affordable to all. Therefore, these medicines should be included in national essential medicines lists, which would enable governments to use scarce resources to select medicines more effectively.

Including cancer medicines in the WHO Essential Medicines List is the crucial first step. Effective national policies incorporating legal and regulatory frameworks that promote access are needed to make cancer diagnosis and treatment widely available.[2] Cancer medicines often come at a high price, creating challenges even for high income countries (HICs), while their availability in LMICs is limited or non-existent. The new WHO Essential Medicines List should prompt governments and other stakeholders to take action to decrease the price of medicines in order to make them accessible.

The situation of lenalidomide in South Africa is a case in point. Lenalidomide is an essential medicine for the treatment of multiple myeloma. Until 2016, South African patients had access to generic lenalidomide manufactured in India under a section 21 legal authorisation that allows the sale and use of unregistered products. The generic lenalidomide was priced at US$2289 per patient per year. This authorisation was withdrawn when Celgene registered its patented product in the country and priced it at