

問題 1 . 次の文章を読み、設問に答えなさい。なお「*」の付いた箇所は本文の後に語注があるので参考にしなさい。

A ground-breaking* study in Bangladesh has found that using data from mobile phone networks to track the movement of people across the country can help predict where outbreaks of diseases such as malaria* are likely to occur, enabling health authorities to take preventative* measures.

Every year, malaria kills more than 400,000 people globally - most of them children. Menpaw Mro lifted his young daughter on to his shoulders and began the long journey to the nearest hospital, in the Chittagong Hill Tracts, first (a) foot, then by boat and finally in a small motorized rickshaw*.

Time was desperately short. For several days, he had assumed the fever afflicting* six-year-old ① Rum Rao Mro was not serious and she would soon recover at home, in their village in this remote region of Bangladesh. Instead, the fever steadily worsened, putting her life in danger. "She could not sleep, she was crying all the time and had breathing difficulties," he says. They never reached the hospital. Rum Rao died (b) the last leg of the journey. She'd been suffering from severe malaria.

Although in many areas of Bangladesh the number of people falling ill or dying (c) the malaria has dropped dramatically in recent years, it remains a persistent problem in the Chittagong Hill Tracts - (d) the region recording the highest number of cases in the country.

If these stubborn* pockets of malaria were now to be tackled successfully, it would open up the tantalizing* possibility of Bangladesh finally [②] . But doctors in the Hill Tracts believe they have only a short window of time to achieve this, because the parasites* carrying the disease are becoming increasingly drug resistant*. Many anti-malarial medicines now have no impact.

This (A) originated in Cambodia and has now spread to Myanmar, which shares a border with the Chittagong Hill Tracts, as do parts of eastern India. "It's concerning because the malaria figures in India and Myanmar are (B)," says Dr. Kamrul Hasan, who works in one of the main hospitals in the Hills Tracts. "Their rate of infection is much higher than ours. That's why there is the possibility of the disease spreading into our country."

But now help is (e) hand from an unexpected source: the mobile phones of millions of

Bangladeshis. It is part of a project based in the Chittagong region that for several years has been anonymously* tracking the movements of people in the area using the data from their mobiles. ③The big data provides an accurate picture of where they've traveled to in the region and beyond, making it possible to predict where malaria outbreaks are likely to occur.

While malaria is caused by mosquitoes biting people and in so doing introducing malaria parasites into the bloodstream*, the insects themselves have a very short range of travel. It is humans traveling to different parts of the country who can spread the disease. If they are carrying malaria parasites, these can be passed in to the local populations through mosquito bites.

Thousands of kilometers away in the Norwegian capital, Oslo, the phone company Telenor collates* all the anonymous* data and sends it to be (C) by academics at Harvard School of Public Health and a research unit in Thailand run by specialists from Oxford and Mahidol universities. "This is the first time we are using the mobile data to address the mobile and migrant* population within the country," says Dr. Mohammed Akataruzzaman, of Bangladesh's National Malaria Elimination* Program. "This kind of big data through the mobile phone recording and also patient surveys about the disease will obviously help with the elimination of malaria within the country."

④The different types of data, including medical information provided by the Bangladesh ministry of health, are used to create risk maps indicating the likely locations of malaria outbreaks so the local health authorities can then be warned to take preventative action, including spraying insecticides* and stockpiling* bed nets and medicines to protect the population from the disease.

"I believe it is extremely important to use accurate information about travel patterns in order to understand how these diseases spread," says Kenth Engo Monsen, Telenor's senior research scientist. "And a mobile operator has that information, so if you are truly going to eliminate* these threats, then you also have to use this information. It's one piece of the puzzle."

That is a view shared by Dr. Caroline Buckee, of Harvard School of Public Health, who says that understanding where parasites move to and from in Bangladesh is a major step forward. "This is going to be (D) to achieve elimination of malaria," she says.

And this innovative* use of big data could be used to help tackle other diseases, according to Mr. Monsen, who believes the Bangladesh project could change the way mobile data will be used in the future.

出典 ; Richard Galpin, Big data 'can stop malaria outbreaks before they start' (BBC News)

一部改変

[語注]

ground-breaking 革新的な

malaria マラリア

preventative 予防的な

rickshaw 人力車

afflict 苦しめる

stubborn 頑固な

tantalizing うずうずするような

parasite 寄生虫

resistant 耐性がある

anonymously 匿名で

bloodstream 血流

collate 照合する、整理する

anonymous 匿名の

migrant 移住性の

elimination 撲滅

insecticide 殺虫剤

stockpile 備蓄する

eliminate 排除する

innovative 革新的な

[設問 1] 本文中の (a) から (e) に入る最も適切な語を、それぞれの選択肢ア～オから 1 つ選び、その記号を答えなさい。

- | | | | | | |
|-------|--------|---------|---------|---------|---------|
| (a) | ア. at | イ. for | ウ. on | エ. to | オ. with |
| (b) | ア. for | イ. from | ウ. on | エ. over | オ. with |
| (c) | ア. by | イ. for | ウ. from | エ. on | オ. to |
| (d) | ア. for | イ. into | ウ. of | エ. over | オ. with |
| (e) | ア. at | イ. by | ウ. for | エ. to | オ. over |

[設問 2] 本文中の (A) から (D) に入る最も適切な語 (句) を、それぞれの選択肢ア～オから 1 つ選び、その記号を答えなさい。

- | | | |
|-------|--------------------------|-----------------------------|
| (A) | ア. tribal network | イ. primitive technology |
| | ウ. successful campaign | エ. drug resistance |
| | オ. wide-area movement | |
| (B) | ア. almost the same | イ. both much better |
| | ウ. among the best | エ. somewhat good |
| | オ. worse than ours | |
| (C) | ア. analyzed | イ. published |
| | ウ. abandoned | エ. restored |
| | オ. collected | |
| (D) | ア. absolutely critical | イ. increasingly unimportant |
| | ウ. practically identical | エ. rather complicated |
| | オ. relatively reasonable | |

[設問 3] 下線部①の少女の容態はその後どうなったか。句読点を含めて 60 字以内の日本語で答えなさい。

[設問 4] 本文中の空所 [②] を補うには、下のア～オの語（句）をどのような順序で用いればよいか。正しい順序を記号で答えなさい。

ア. itself イ. to declare ウ. the deadly disease エ. free of オ. being able

[設問 5] 下線部③を日本語に訳しなさい。

[設問 6] 下線部④はどのようなデータか。また、これらのデータはどのように使われ、どのように役立つか。句読点を含めて 120 字以内の日本語で答えなさい。

[設問 7] ヒトはどのようにしてマラリアに感染するか、またその蔓延地域はどのようにして拡大するか。句読点を含めて 100 字以内の日本語で答えなさい。

[設問 8] 以下のア～キの文のうち、本文に一致するものを全て選び、その記号を答えなさい。

- ア. Rum Rao Mro という名前の少女は、もし父親がもっと早く病院に運べば、マラリアに感染しなかった。
- イ. Chittagong Hill Tracts と呼ばれる地域では、マラリアが多発していたが、現在の患者数は激減している。
- ウ. 従来の治療薬に耐性を持つマラリアがさらに拡大する恐れがあるため、新薬の開発が進められている。
- エ. マラリアが高密度で発生する地域の予測は、事前対応が可能となるため、マラリア対策に有効であると考えられる。
- オ. 携帯電話の位置情報を使えば、マラリア患者の移動を追跡できるが、患者の個人情報保護の観点から反対する人もいる。
- カ. 携帯電話から収集される膨大な情報は、マラリアや他の疾病対策に利用できると考えている研究者がいる。
- キ. Kenth Engo Monsen と Dr. Caroline Buckee はともに、マラリアの予防と治療のための蚊帳や医薬品の備蓄を推進している。

問題 2. 次の文章を読み、設問に答えなさい。なお「*」の付いた箇所は本文の後に語注があるので参考にしなさい。

Several countries and US states have recently legalized* euthanasia*, assisted* suicide, or both, including Canada and California, USA. In 2017, more than 13000 patients died through (a) method of assisted death in countries where these practices are permitted. Euthanasia and assisted suicide have been legal in the Netherlands* and Belgium since 2002, whereas assisted suicide has been legal in Switzerland since 1918 and in Oregon, USA, since 1997.

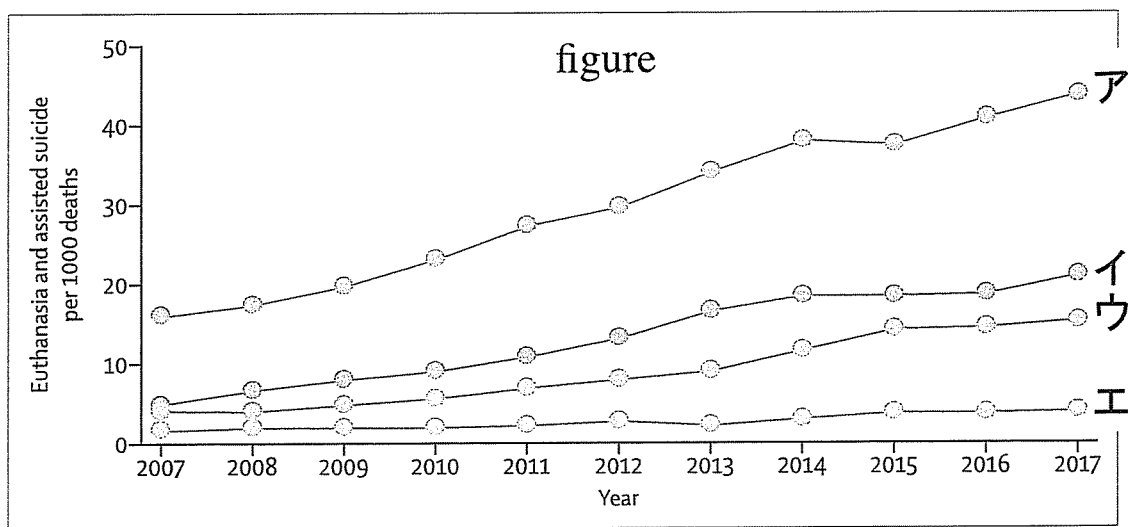
In 2014, we presented aggregated* data for 2003-12 comparing the frequency of assisted deaths in countries or states that allowed both euthanasia and assisted suicide (the Netherlands and Belgium) with the frequency of assisted deaths in countries or states that only allowed assisted suicide (Switzerland and Oregon). Here, we present aggregated data for 2007-17 from the same jurisdictions* (figure). ① Assisted deaths continue to rise substantially* in Belgium and the Netherlands, with assisted suicide constituting 3.5% of assisted deaths in the Netherlands in 2016. The frequency of assisted deaths in Oregon is increasing at a much more reduced rate than in the Netherlands and is currently at less than 10% of Dutch* numbers (3.9 per 1000 deaths in Oregon vs 43.9 per 1000 deaths in the Netherlands in 2017). The rate of increase in assisted suicides in Switzerland, where this practice is tolerated without legal safeguards* or monitoring, is similar (b) the rate of increase in Belgium and the Netherlands, with a frequency that is approaching that of Belgium.

In assisted suicide, patients take the lethal* drug themselves, whereas doctors administer the drug in euthanasia. In 2012, this appeared to be a main reason for the higher frequency of assisted deaths in the Netherlands and Belgium, compared with Oregon and Switzerland. Yet data from the past 5 years suggest that the lack of legislation in Switzerland could also explain the higher frequency of assisted suicide, particularly since an increasing number of patients without terminal* illness obtain permission for assisted suicide in Switzerland. (c) contrast, the lower frequency in Oregon might be explained by the requirement of a maximum life expectancy* of 6 months and by the requirement that patients obtain a lethal dose from the pharmacy* for auto-administration*. (d) average, 36% of these patients in Oregon end up not using the lethal drug and die of their illness.

Euthanasia is quickly approaching (e) % of all deaths in the Netherlands, which is a higher proportion than in Belgium (although underreporting* is suspected in Belgium). In 2016,

Canada legalized euthanasia, and California regulated assisted suicide as in Oregon. In 2017, euthanasia already represented almost 1% of all deaths in Canada, whereas only 374 Californians died by assisted suicide (0.14% of deaths).

Legalizing only assisted suicide with stringent* procedural* rules that exclude patients who are not terminally ill, as has been the case in Oregon, therefore seems to limit the number of assisted deaths and their increase with time. ②This hypothesis will be validated* further when assisted deaths are legalized in more countries in the future.



出典 ; The Lancet 393: 982-983, 2019 より抜粋、一部改変

[語注]

legalize 合法化する

euthanasia 安楽死

assisted 幫(ほう)助(された)

Netherlands オランダ

aggregated 集計された

jurisdictions 地域

substantially 大幅に

Dutch オランダの

legal safeguards 法的保護

lethal 致死の

terminal 末期の

life expectancy 余命

pharmacy 薬局

auto-administration 自身への投与

underreporting 過少報告

stringent 厳格な

procedural 手続きの

validate 評価する

[設問 1] (1) 下線部①を日本語に訳しなさい。

(2) 図のア～エに該当する国名または州名を日本語で答えなさい。

[設問 2] 本文中の空所 (a) から (e) に入る最も適切な語を、それぞれの選択肢ア～エから 1 つ選び、その記号を答えなさい。

- | | | | | |
|-------|-----------|---------|------------|--------|
| (a) | ア. either | イ. both | ウ. another | エ. new |
| (b) | ア. at | イ. to | ウ. on | エ. of |
| (c) | ア. On | イ. To | ウ. By | エ. Of |
| (d) | ア. On | イ. To | ウ. By | エ. Of |
| (e) | ア. 0.05 | イ. 0.5 | ウ. 5 | エ. 50 |

[設問 3] euthanasia と assisted suicide の方法の違いについて、本文の内容から句読点を含めて 50 字以内の日本語で述べなさい。

[設問 4] 筆者は最近の 5 年間で、assisted suicide が Switzerland で多く、Oregon で少ない理由をどのように述べているか。具体的に日本語で説明しなさい。

[設問 5] 下線部②に関して、この内容を具体的に日本語で答えなさい。

[設問 6] この論説文の最も適切なタイトルを、以下の選択肢ア～エから 1 つ選び、その記号を答えなさい。

- ア. Regulation of assisted suicide limits the number of assisted deaths
- イ. Regulation of euthanasia limits the number of assisted deaths
- ウ. Recommendation of assisted suicide for assisted deaths
- エ. Recommendation of euthanasia for assisted deaths