


Neglected tropical diseases

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 **UNCOMFORTABLY CLOSE**
Watch an inspiring message from Richard Allan, director of The MENTOR Initiative **P4**

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Professor Sir Roy Anderson on eliminating NTDs:
“What is needed is the will to harness all this potential”

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The deadliest disease you've never heard of
Be empowered to effect change by a video supported by the Global Schistosomiasis Alliance

United against neglected tropical diseases

More recognition is needed for this neglected pandemic that is trapping poor communities into a spiral of illness and deprivation

Neglected tropical diseases (NTDs) are a group of bacterial, viral and parasitic infections found primarily among low-income populations in developing countries in tropical regions. Common NTDs include lymphatic filariasis (elephantiasis), onchocerciasis (river blindness) and schistosomiasis (snail fever), all of which thrive in conditions of poverty.

Around one billion people are affected, and there may be another billion at risk. The problem is that NTDs don't get recognition, even though the associated annual death toll –

estimated at around 350,000 – is far greater than that for diseases like Ebola, for example.

Another important issue is the enormous disability burden of NTDs, which among other things can cause blindness, epilepsy, chronic anaemia and disfiguring skin lesions. This has a negative impact on patients and causes a vicious circle of deprivation for patients, families and caregivers, who may not be able to earn a living or receive an education. Ultimately, neglected tropical diseases affect the overall social and economic development of poorer communities.



Professor David Molyneux
Senior professorial fellow, NTDs Lead, Liverpool School of Tropical Medicine

Multi-targeted approach

There is no single way to tackle NTDs, but rather a combination of strategies, including mass drug administration, control of insect vectors, access to safe water, better sanitation, and improved education. Intersectoral collaboration within governments and strong partnerships are also crucial, as it is a commitment to overcome challenges – like the rapidly growing outbreak of leishmaniasis (which causes permanent disfiguring skin scars) in Syrian refugee camps. NTD programmes have benefited

hugely from the generosity of drug donations from major pharmaceutical companies but continued research to improve interventions for better drugs and diagnostics is essential.

Indeed, much has been done in recent years thanks to partnerships. However, to ensure progress continues in the future, people must recognise that NTDs, in addition to causing enormous suffering and social stigma, drive communities into poverty and result in catastrophic health expenditures by families, making their elimination a priority. ■

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A future free from schistosomiasis

By Kate Sharma

Neglected tropical diseases are rarely a cheerful topic. But when it comes to schistosomiasis, leading scientists are optimistic about the future

Schistosomiasis is often described as the biggest killer no one's ever heard of. Spread by parasitic worms that breed in contaminated water, the parasite currently infects around 249 million people, according to the World Health Organisation (WHO). 90 per cent of cases are now in Africa. The symptoms of schistosomiasis are not always obvious, but as the parasites continue to damage the body of a carrier they can lead to terminal conditions such as liver and kidney failure and even bladder cancer.

The good news is that the parasite and the disease can

be treated with a single oral drug. In treated children, the symptoms are immediately reversible and the world has never been in a better place to respond, as Dr Lorenzo Savioli, chair of the Executive Group of the Global Schistosomiasis Alliance (GSA), explains. "Countries now have the support of donated drugs, logistical support and technical assistance at an unprecedented level, so there's no reason why we can't see the same results in Africa that we have seen in South America and China - that didn't benefit from donated drugs."

"In countries where drugs have been distributed amongst primary school aged children in at risk communities, school attendance has improved and life expectancy has increased by around 15 years."

In 2012 very ambitious targets



Dr Lorenzo Savioli

Chair, executive group, Global Schistosomiasis Alliance (GSA) &

Professor Alan Fenwick

Director, Schistosomiasis Control Initiative (SCI)



ferred treatments to deal with schistosomiasis," says Fenwick. "Today every country has a national plan, and the science and technology company Merck donates up to 250 million tablets of medication per year to support the efforts of the WHO and its member states to control the disease."

Both Savioli and Fenwick are confident that with the combined support of WHO, governments, Merck, and local partners, morbidity rates across Africa can be reduced immediately. "Once morbidity rates are under control we can focus on eliminating schistosomiasis altogether as ambitiously proposed by WHO," says Savioli. "This will involve regularly providing treatment and also tackling the underlying causes by improving water and sanitation systems in hot spots where transmission is intense." ■

were set to eliminate schistosomiasis as a global health problem by 2025, provided praziquantel, the drug of choice for the treatment of the disease, became available. It's a target that both Savioli and Professor Alan Fenwick, Director of the Schistosomiasis Control Initiative (SCI), believe can be reached. "16 years ago not a single country in Africa of-

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The world has the tools it needs to end human deaths from canine rabies by 2030. There's power in numbers.

Lend your voice and take action at EndRabiesNow.org



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99.9% FATAL 100% PREVENTABLE

#END RABIES NOW



INSPIRATION

 INFOGRAPHIC

Countries/Regions
not viewable in the
main map extent*



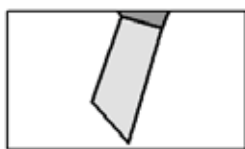
Malta



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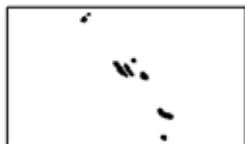
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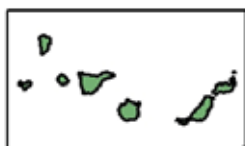
Gibraltar



Liechtenstein



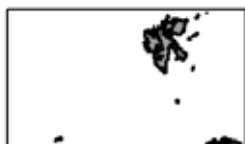
Azores (PD)



Canary Islands (ES)



Madeira (PT)

Svalbard
and Jan Mayen (NO)

Too close for comfort

Europe has largely been spared the scourge of neglected tropical diseases, but as insects that spread the parasites continue to thrive, an increasing number of cases are being diagnosed concerningly close to home

By Kate Sharma

“The problem is that for a lot of vector borne diseases, such as dengue fever, there is no quick fix,” explains Richard Allan, director of the MENTOR Initiative, a humanitarian organisation that specialises in vector borne and tropical disease. “There are no drugs that can be given on mass to protect communities, and cure is complicated. Control is all about managing your environment - and that’s a real challenge.”

But it’s a challenge the world needs to face. According to the World Health Organisation the number of cases of dengue fever has increased from 0.4 million in 1996 to 3.2 million in 2015, and the epidemic is no longer contained in a handful of countries. Before 1970, only nine countries had experienced severe dengue epidemics. The disease is now endemic in more than 100 countries with hundreds of cases reported in France, Italy, Spain and Greece.

The vector responsible is *aedes aegypti*

ti, a mosquito which has migrated from tropical and subtropical climates, to Mediterranean Europe. Whilst *aedes aegypti* is not well suited to the seasonal climate of Northern Europe, it’s hardy relative, *aedes albopictus*, which also carries the virus that causes dengue fever, is. “Every year there are sightings of the tiger mosquito [*aedes albopictus*] in the UK,” confirms Mr. Allan. “There have been no cases of dengue fever being contracted in the UK, but it’s just a matter of time.”

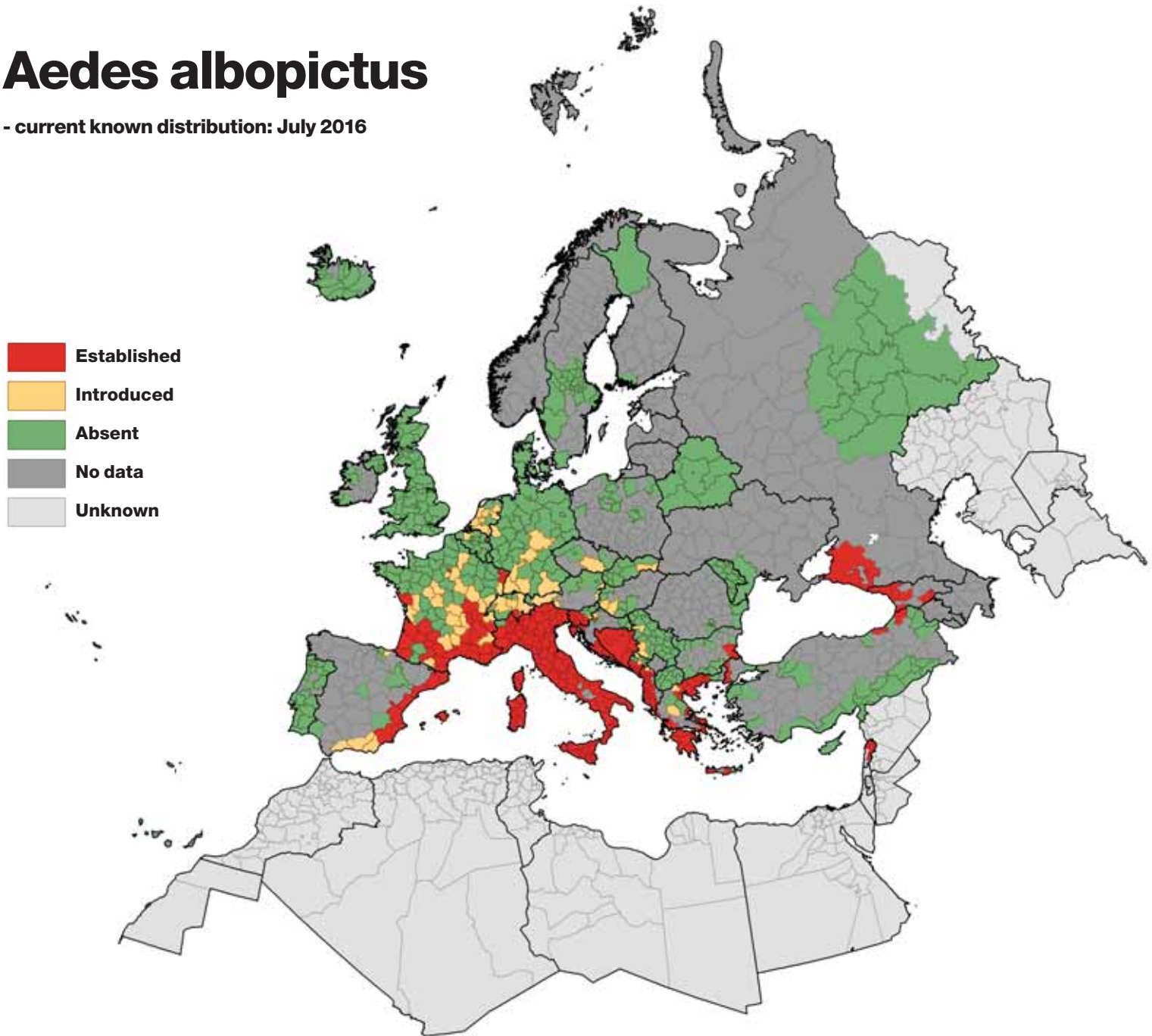
Another disease that is on the increase is leishmaniasis. Until now, leishmaniasis has been largely endemic in Asia, Latin America, Africa and the Middle East, where sand flies that spread the parasite live in cracks of buildings and breed in areas of refuse. Since the outbreak of the Syrian war, The MENTOR Initiative report that the number of cases of leishmaniasis has grown from 40,000 annually to more than 200,000 at its peak in 2013.



Dengue fever was historically found mostly in tropical settings, transmitted by *Aedes aegypti* mosquitoes. *Aedes Albopictus*, was only identified as a vector in 2005. It is an invasive species originally from S E Asia, that is able to outcompete local mosquito species in Africa and is rapidly establishing itself across the more temperate climates of Europe and America.

Aedes albopictus

- current known distribution: July 2016



ECDC and EFSA. Map produced on 2 Aug 2016. Data presented in this map is collected through the VectorNet project. The maps are validated by designated external experts prior to publication. Please note that the data do not represent the official view or position of the countries. * Countries/Regions are displayed at different scales to facilitate their visualisation. Administrative boundaries: ©EuroGeographics; ©UN-FAO; ©Turkstat.

Leishmaniasis has a number of different variants that cause horrific skin lesions and ulcers. “The images are the stuff of horror films,” says Mr. Allan. “We’ve seen children who literally have no face below the eye sockets.” In addition, the disease also occurs in another form that destroys vital organs and eventually kills. This less common visceral form of the disease is also increasing to very concerning levels.

The Mentor Initiative have helped to protect thousands of Syrians through



Richard Allan

Director,
The MENTOR Initiative

the distribution of insecticide-treated sand fly nets and window and door curtains, alongside the spraying of homes. Whilst this helps to control the disease locally, the sand flies continue to breed and spread their disease much further afield. Cases of leishmaniasis are being reported across the Middle East and as far afield as Southern Europe.

So what can be done? In the last few months, breakthroughs in the development of a vaccine for dengue fever and the zika virus have offered some hope,

but these are still years away from being rolled out for public health use. Whilst research goes on, the insects continue to thrive, spread disease and devastate countless lives.

The good news is; the disease is controllable through integrated vector management. If resources and finances are channeled to urban populations where the diseases thrive, we can control them. But success relies on public and political commitment at a serious scale. ■

INSPIRATION



COLUMN

**Helen Hamilton**

Chair of UK Coalition against NTDs

The Sustainable Development Goals and NTDs

The Sustainable Development Goals (SDGs) include a global commitment to 'leave no one behind'. This promise is essential in the fight against neglected tropical diseases (NTDs), which reinforce a cycle of chronic misery, ill health and stigmatisation for the world's poorest and most marginalised populations.

We are making impressive progress- more people than ever are being reached with treatments. The UK has long been a global champion of efforts to combat NTDs, recognising them as a 'best buy' in health. Now, with the SDGs and the World Health Organization's NTD Roadmap, the inherent link between NTDs and other essential services, including water, sanitation and hygiene is well recognised. Universal Health Coverage, which aims to give everyone access to quality, healthcare without financial hardship, is vital to improving these services and working towards control and elimination of NTDs. It requires investment in workers and infrastructure, and relies on governments in endemic countries to increasingly take ownership of health programmes.

Goal 3 (on 'healthy lives') in the SDGs includes a dedicated NTD target and indicator, to track who is being reached by NTD interventions. This gives us an unparalleled opportunity to put an end to the scourge of neglected tropical diseases. ■

Read more on globalhealthaction.co.uk

MDA in Basansan, Kware - CDD Aliyu Abdullahim (crouching down), local health worker Bello Buliara (white shirt), MDA recipient Muzambilu Abubakim (brown shirt)

Unleashing the power of good logistics

By Lorena Tonarelli

Logistics plays a major role in ensuring and maintaining adequate drug coverage and, in turn, control or eliminate neglected tropical diseases

Professor Sir Roy Anderson, director of the London Centre for Neglected Tropical Diseases Research, explains that major neglected tropical diseases (NTDs), including schistosomiasis and trachoma, can be controlled with mass administration of relatively simple drugs, which are donated by pharmaceutical companies to poorer countries.

"The problem is not one of availability, but of logistics," he says. There is the need to ensure that the drugs that are delivered to warehouses in capital cities are then transported to primary health centres in villages and communities, particularly those in remote rural areas. But there are indications that, at least for some NTDs, this is not happening and that, as a result, not all children and adults who need treatment actually receive it.

"We have examples of this in South Africa, South East Asia and India, where the reported drug coverage is much greater than research suggests," says Anderson, adding that some countries are also not

**Professor Sir Roy Anderson**

Director, London Centre for Neglected Tropical Diseases Research

monitoring whether or not children and adults with NTDs take their medicines as often as necessary.

Improving drug supply

He goes on to say that, whilst the logistics of drug supply to NTD-affected poor communities poses significant challenges, a number of factors - including building local support, strengthening systems for the good flow of goods and services, and disease surveillance - can help towards its improvement.

The following interventions, in particular, are paramount, continues Anderson. "Firstly, one of the best ways of improving drug supply is to create local demand. This can be achieved by increasing awareness, among community leaders, of

the fact that treatment can greatly improve the health of children, enabling them to grow and develop.

"Secondly, local ministries of health should make it a priority to get NTD drugs out of the warehouses into local villages and communities. It might be useful, in this regard, to look at examples from the commercial world. If soft drink companies can get their products to the smallest villages in Africa, then surely ministries of health can get critical healthcare supplies out there, too.

"Thirdly, there should be more primary healthcare centres to which drugs are distributed, with people who are trained in administering those drugs. Close collaboration between ministries of health and ministries of education is also crucial, because schools can be a very important setting in which to deliver life-saving healthcare messages and treatments."

We need the will

The fact is, there is no shortage of supply of drugs to countries with NTDs. And there are systems and tools available to ensure these drugs are delivered to the children and adults who need them, says Anderson. What is needed is the will to harness all this potential. ■

WHY WE NEED TO END RABIES NOW

Canine rabies is one of the world's oldest diseases, eliminated in countries like the US and the UK, but still a daily threat to millions around the world.

Every **09** minutes,
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RABIES.



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99%
of human rabies
deaths.

 **100%**
of human cases are
preventable.



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70%
of dogs in at-risk areas
can eliminate canine
rabies.

Nearly
85%
of the world is at
risk of contracting
canine rabies.



Canine rabies kills more than
59,000
people every year.



2.9 million
lives are saved annually due to
preventative measures.

**It doesn't have
to be this way. Together, we can
end rabies for good.**



Take Action at EndRabiesNow.org





Natural History Museum joins the fight against Neglected Tropical Diseases



PHOTO: © ELSA LEGER

The Natural History Museum has extensive collections that have been at the heart of understanding parasitic diseases, and their impact on human and animal populations

Opening up our collections has allowed our scientists and collaborators to answer fundamental questions. What is the life cycle of the parasite? What transmits the pathogens and parasites? Who infects whom? Where has the disease come from? How is it changing? Where might the disease spread?

The Museum is uniquely placed to tackle research on disease-causing and disease-transmitting organisms and has a distinguished record of pioneering research on health and disease. We use our unique collection and expertise on a wide range of parasites and pathogens of humans, livestock, fisheries and wildlife. Our collections provide researchers with a baseline for tracking biological change through time; important in the fields of drug resistance, elimination, disease emergence, and host-switching.

We have built strong relationships with bodies such as the World Health Organization (WHO) that allow us to deliver ambitious research programmes. These collaborations

have enabled us to make important discoveries and to contribute to major public health programmes in disease control.

We are proud to partner with funding agencies nationally and internationally in combatting neglected tropical diseases (NTDs) and are committed to supporting the WHO roadmap in disease control, elimination and eradication. We are committed to making our data available to all, to unlock the potential of existing collections, and to collect new material for ongoing and future research.

Schistosomiasis

Schistosomiasis aka Bilharzia is a debilitating and persistent disease linked to poor sanitation and lack of clean water. Caused by the *Schistosoma* blood flukes, an estimated 250 million people worldwide are infected with over 90% of cases found in Africa. Infants and children are especially prone to infection and the damage caused by schistosomes can lead to painful chronic cramps, anaemia, lethargy, genital lesions and severe damage to internal organs particularly the kidneys, bladder and liver.

The NHM is a WHO Collaborating Centre in recognition of its expertise in identifying the parasites that cause the disease and the aquatic intermediate host snails responsible for its transmission. We help na-

tional schistosomiasis control and elimination programs find better diagnostics and interventions to reduce the impact and prevalence of the disease. We support researchers and international collaborations by providing field-collected schistosome genetic material from our rapidly expanding schistosome and snail collection called SCAN (Schistosomiasis Collection at the NHM).

The NHM team currently concentrates its research and control efforts in endemic areas of Africa and is currently working with partners in the United Republic of Tanzania including the Zanzibar islands, Niger, Angola, Senegal and Cote D'Ivoire.

Soil Transmitted Helminths

Over 1.45 billion people are infected with soil-transmitted intestinal worms, including 845 million children, in some of the world's poorest communities. These worms reduce the body's ability to absorb nutrients and vitamins. This can exacerbate malnutrition and lead to anaemia, increased susceptibility to other infectious diseases, stunted growth and impaired cognitive development.

A new project, entitled DeWorm3 funded by the Bill and Melinda Gates Foundation, aims to demonstrate the feasibility of eliminating parasitic

worms using existing and intensified mass drug administration strategies in Benin, Malawi and India.

Insect vectors of disease

Our research on disease vectors focusses on mosquitoes, primarily the classification of this family of more than 3,500 species, with especial emphasis on those of medical importance, which transmit NTDs such as Dengue fever, Chikungunya and Lymphatic Filariasis.

The Museum will achieve this by developing tools such as the Mosquito Taxonomic Inventory (MTI) website, which provides an authoritative resource on the global diversity of the mosquito.

The site currently includes individual pages for taxonomic groups (family, subfamilies, and fossil mosquitoes), a comprehensive anatomical glossary, informal classifications and an evolving bibliography. Updates will include profiles on individual species, and an index of all valid and synonymous names.

Accurate identification and understanding of mosquito species allows crucial disease outbreak surveillance and control. Our collections of tsetse flies, sandflies and black flies are also relevant to investigations of trypanosomiasis (sleeping sickness), leishmaniasis and onchocerciasis (river blindness) respectively. ■



For more information:

www.nhm.ac.uk/our-science

www.nhm.ac.uk/collections

www.nhm.ac.uk/deworm3

www.mosquito-taxonomic-inventory.info



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