

### Scenario Writing Competition

This Future Scene served as inspiration for the Scenario Writing competition at International Conference 2022. Competitors read the Future Scene and responded by writing a Scenario of 1000 words that fit within the Future Scene's parameters: time, place, and topic.

*Antibiotic Access Roundtable, University of Oslo, 6 April 2041*

The Norwegian Minister for Health, Inger Larsen, is hosting a roundtable event, bringing together experts from different sectors across Norway to discuss access to antibiotics and our continued work against antibiotic resistance.

#### Attendees:

Professors Nora Kristiansen and Karl Johnsen, University of Oslo  
Christos Pavlis, Oslo Refugee Council  
Gunnar Moen, Antibiotic Compliance Council  
Maja Guldager, Association of Norwegian Dairy Farmers

*Livestream start time: 2:05pm*

**Inger:** Velkommen alle sammen. Thank you for joining me today. We are here to discuss the important issue of antibiotic access. Norway is the healthiest country in the world, but we must not take this for granted. To start the discussion, I have asked Professor Nora Kristiansen and Professor Karl Johnsen to provide some background information about an important consideration for today's roundtable: antibiotic resistance.

**Nora:** Thank you, Minister. As you all know, antibiotic resistance is one of the greatest threats to human health this century. Recent pandemics have seen antibiotic-resistant bacteria causing illness around the globe. Many lives were lost to tuberculosis, salmonellosis, and staphylococcus infections, until the development of a new antibiotic: Hyphaebactin. Doctors and researchers around the world knew that once Hyphaebactin became commercially available, we'd be able to treat diseases that were resistant to other antibiotics. But we have to use it sparingly to prevent bacteria from becoming resistant to Hyphaebactin too, repeating the mistakes of our past.

**Inger:** That's why the International Antibiotic Summit was held in 2038, which led to the Santiago Agreement. Seventy-nine countries ratified the agreement, committing to the restriction of antibiotic use, protecting effectiveness for those who need it most. Each country has the freedom to develop its own criteria, but the total number of imports and prescriptions are closely monitored by the Global Antibiotic Protection Committee (GAPC). If any country breaches the agreement, their Hyphaebactin allowance will be reduced.

**Nora:** Hyphaebactin is currently the only effective antibiotic we have for some diseases, but researchers, including my colleague Karl, continue to work hard to identify new antibiotics.

**Karl:** Thanks Nora. I lead the antibiotic innovation team here at the university, and we've been working hard over the last decade to engineer new antibiotics. Using molecular engineering technology and RNA synthesis, we create and test over 300 nanostructures every day to identify if any could help fight against bacterial infections. We haven't been successful with long-term solutions yet, but continue to find ways to accelerate our efforts.

**Inger:** Thanks Karl. I'd like to move on to the operation of the current antibiotic management system.

**Christos:** As you know, I represent the Oslo Refugee Council, and my concern is that the current system is inequitable. Subsidized healthcare is only available to Norwegian citizens, so it's very difficult for refugees to access Hyphaebactin, even when they are very sick, because they can't afford the private clinic fees. Just yesterday I spoke to a refugee man with antibiotic-resistant tuberculosis. He needs Hyphaebactin, but appointments with a general practitioner, a pulmonologist, and an Authorised Antibiotic Officer (AAO), would cost more than he earns in a month. Rent is very

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expensive here, so he has no savings. Because he can't access Hyphaebactin, he's trying whatever treatments he can find, but I'm worried he's just wasting his money on things that don't work.

**Inger:** And then there are people living in the Pacific islands who have almost no access to Hyphaebactin at all. Many countries have tightened their borders in the past two decades to slow disease spread. Still, we know that this issue concerns Norway and all nations committed to combatting antibiotic resistance.

**Christos:** Yes, these countries' allocations are small, and supplies often go missing in transit. The Global Antibiotic Protection Committee does not have the resources or authority for adequate security on all antibiotic transport vessels. People have been arriving from the Pacific islands in need, and we are unable to offer them the care they deserve. They also pose great risk of spreading these dangerous diseases amongst those least able to access treatment.

**Nora:** Even for Norwegian citizens, it's not always equitable. Wealthier people are more likely to know which doctors to see to get the prescriptions they need.

**Gunnar:** Speaking from the perspective of the Antibiotics Compliance board, we've noticed that another cause of inequity is that some doctors are more likely than others to grant approval for a patient to see an Authorized Antibiotic Officer. While most AAOs uphold the rules, some don't. It's common for patients with minor illnesses to threaten AAOs when they are told they're not eligible for Hyphaebactin. Threats like this have caused some AAOs to begin to exhibit signs of burnout and post-traumatic stress disorder, while others illegally distribute Hyphaebactin to prevent these incidents. There was also the AAO who was imprisoned for accepting bribes in exchange for Hyphaebactin approvals.

**Maja:** So far, we've been talking about how this affects human welfare, but many of the same issues are also present in the veterinary world. Farmers are struggling to treat bacterial infections in their herds. In response, veterinarians are being bribed – just like Gunnar was saying – or selling antibiotics on the black market. Some farmers are using Hyphaebactin for animals that aren't sick, as a preventative, like they did a few decades ago.

**Nora:** That's the kind of behavior that caused antibiotic resistance in the first place.

**Maja:** But they can't afford to keep losing their stock.

**Inger:** Well, we've certainly heard a lot of concerns mentioned this afternoon. The views shared have pros and cons for differing groups of people and animals. What might the future hold for these groups as the field of antibiotics continues to change?

Title: Hyphaebatin: Friend or Foe

"When antibiotics became industrially produced following WW2, our quality of life and our longevity improved enormously. No one thought bacteria were going to become resistant."

-Bonnie Bassler

"Benjamin! Think of Janice! Without this, who knows what will happen!"

As I hide behind the stairs just outside of my bedroom, I hear all of their fights. Being sick in 2041 is a nightmare. I've had Tuberculosis for roughly two years, but after the first round of normal antibiotics didn't work, we learned that I had an antibiotic resistant form of the disease. My parents went through five counties trying to find one with Hyphaebactin available, since supply is always low according to dad.

"The mortality rate has skyrocketed, Benjamin! Can you really not think about someone else in your life? Not even your own daughter?"

I remember when I first started showing symptoms, everyone thought it was some type of viral infection, like the flu. When it started getting worse and I developed new symptoms, I was rushed to the hospital, where after they assessed my signs and ran a few tests, they diagnosed me with TB. I still remember the hologram that came to my parents, I don't think I'll ever be able to forget it. "Your daughter has been infected with Tuberculosis, I'm sorry." Their reactions were chilling, as they began to understand the toll that the treatment would take on our lives.

"I'm trying to save us, Julia! Hyphaebactin is impossible to get nowadays! Do you want the whole lot of us to suffer?"

When we began the old antibiotic treatment, a holographic doctor would appear every day at 5:30pm and would make sure I took the right set of pills each day, as Rifampin and Isoniazid were meant to be taken at first, and once I was mostly cured they would slowly ease me onto different medications. After the symptoms kept getting worse, we decided to do an antibiogram test. The results showed that I had a type of infection that was resistant to nearly every broad-spectrum, derivative, and narrow-spectrum antibiotic besides Hyphaebactin. The AI doctor told my parents that it was some sort of multi-drug-resistant infection. I remember the room went quiet for a moment, and all I heard was the slight whirr of the AI as it projected the doctor. The only thing my father said to the AI was a soft "Thank you."

"Julia, you know rent keeps going up! Since she got sick, it's nearly doubled! Do you even want a roof over our heads?"

My mom is a part of the Antibiotics Compliance Board and doubles as an AAO. She is one of the good ones who only approved the ones who really needed it, though some thought she was being biased by approving me. Ever since the rent has gone up, my dad's started working too; he is a lobbyist for the Global Antibiotic Protection Committee. He tries to get them more authority so they can regulate the security on vessels, making it less likely they will lose any in transport. They used to both share the same viewpoints, until the prices started skyrocketing. My dad immediately was against this, thinking that it would help way less people this way, while my mom thought it was justified and people should just pay for it. From the sounds of tonight's argument, it looks like we might be choosing between Hyphaebactin and this month's rent.

"Well Julia? What's your choice?"

Rent isn't the only expensive thing. I go to several different doctors every two weeks, and even with my family's good jobs, it's a struggle to pay every time. Since so few people are able to get approved, they can charge whatever they want. Mom keeps talking about the ACB trying to use the antibiotic sparingly. See, so many want it that they're afraid of making the bacteria resistant to this too. The threats that mom gets when she doesn't approve someone for it are terrible, though they have added more security to combat that. Dad was also trying to get more regulations on farmers who are using it as a prophylactic dose, because that sort of behavior in a CAFO caused the resistant bacteria in the first place. It seems like everyone is in a sheer state of panic over getting their hands on this antibiotic.

"...You're right Ben. Rent is more important."

I wish I could say that my family's situation is rare, but with poverty levels climbing exponentially, it's far from unordinary. I watch as my parents hug, my mom softly crying into his shoulder. They begin to make their ways to the stairs, which is my queue to return to my room.

"Honey, your mother and I have something we need to tell you..."

-3 years later

"Breaking News: GAPC Gains Authority to regulate security on transportation vessels"

Sitting in my hovering hospital bed, I can't help but smile. Dad finally did it. Last year, mom managed to pass better acts that would better control the spread of Hyphaebactin antibiotics, nearly eliminating the thought of resistant bacteria. Together, they managed to contribute to the lowering of the cost to the miracle medicine and were able to stop the use of it as a prophylactic. The amount of people who are struggling to pay has dropped exponentially, as even doctors have been ordered to lower their prices. Unfortunately, by this time I was too sick to be effectively treated. I wish I could see more, but I fear my time has come to move on. However, I can go now with a peace of mind that the world will be better off with the changes my parents made.