Magazine 2011

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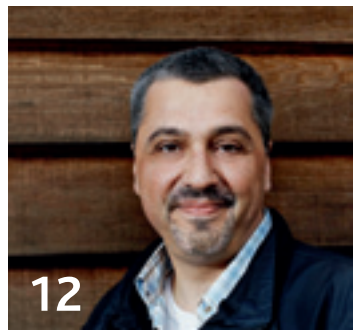
The greatest gift

René Jensen drank heavily – and increasingly – for many years. Although he managed to handle his job, he felt that he isolated himself more and more. Now, seven years after he stopped drinking, he calls his life a gift.



Acknowledging the problem is the first step

The Danish website Hope.dk reaches out to the half a million Danes who have a harmful consumption of alcohol.

The solution is in the brain

The secret behind alcohol abuse is buried deep in the brain – and it may also be here that the solution to the problem is waiting to be found.

The silent disease

Although depression is one of the most common psychiatric disorders, it is still highly stigmatized.

I felt like Sleeping Beauty

Melanie Baybut lives in the stunning beauty of South Africa's Western Cape. Three years ago, she was diagnosed with Chronic Fatigue Syndrome and depression.

Mental health is not a given

Japan and Colombia are examples of countries where access to treatment of brain disorders is improving.

Collaboration to speed up drug development

Lundbeck has recently entered into several new collaborations to speed up the development of new and improved drugs. One of them is NEWMEDS, where pharmaceutical companies join forces with academic institutions.

About Lundbeck

Lundbeck history and facts.

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From idea to patient

Lundbeck is engaged in research, development, manufacturing, marketing and sale of pharmaceuticals worldwide.

I'm fine, Dad

Life changed dramatically for the Todds when their son Adam started having seizures at the age of three.

Visit the Lundbeck website
www.lundbeck.com

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Our work is still needed

At Lundbeck, we continue to work to improve conditions for people suffering from brain disorders.

Anyone who is close to a person with a brain disorder knows how debilitating these illnesses are to the patient and his or her loved ones. Whenever we meet patients, we are confirmed in our understanding of just how serious these illnesses are – and how essential it is to develop and make available effective treatments for them.

We are not only interested in improving the treatments available to patients. We also wish to contribute to making national health authorities aware of how serious brain disorders are, and what can be done to improve the quality of life for those affected by them. We hope in this way to help ensure that more people get access to the treatment they so desperately need.

Many unmet needs

In this year's Lundbeck Magazine we have chosen to shed some light on a few of the areas in which there are still major unmet medical needs. This includes countries around the world where, for various reasons, access to health services is still not sufficiently inclusive, as well as the many brain disorders for which better medications are still needed.

Fortunately, there has in recent years been increasing focus throughout the world on overall better access to health services. It is our hope that better access to treatment for brain disorders will also be an outcome of this development. In terms of lost years of healthy life[1], these diseases are among the most expensive for society; however, it is impossible to calculate the costs to those who are directly affected, or to their loved ones.

In this magazine we share two examples of countries that have begun to focus more directly on these diseases; in one of the cases despite difficult economic and political conditions. We welcome this. We hope that you will find it interesting to read about health conditions in Japan and Colombia.

Our patients will always be our most important stakeholders; it is our knowledge of their needs that motivates our work to develop new and better drugs. We are therefore grateful that three people who suffer from, respectively, epilepsy in the form of Lennox-Gastaut syndrome, depression and former alcoholism have all been willing to share their stories with us and with you. The stories of Adam, Melanie and René let us understand what it is like to live with a serious illness, but they also show us that there is light at the end of the tunnel.

We know that the development of even better drugs requires many resources and much expertise. This is why increased external collaboration is an important element of our new research strategy, which increasingly focuses on the biological relationships and mechanisms that are believed to be the root causes of many brain disorders. The NEWMEDS collaboration, described in this magazine, is a good example of how gathering a group of experts from across several organizations can improve the possibility of developing better treatments.

I hope that you will enjoy reading Lundbeck Magazine 2011, and that the articles will provide you with some insight into what drives Lundbeck's management and employees.

Ulf Wiinberg
President and CEO

1) Lost years of healthy life refers to the World Health Organization's definition of DALY (Disability-Adjusted Life Year), where one DALY can be thought of as one lost year of 'healthy' life

René Jensen drank heavily – and increasingly – for many years. Although he managed to handle his job, he felt that he isolated himself more and more. Now, seven years after he stopped drinking, he calls his life a gift.

The greatest gift

While my wife Brita and I go about fixing up the house we bought last year, I think of how good my life is now. I have a healthy and happy family, a nice dog, a good job, and now a house near the woods and countryside, which I really appreciate.

But things could easily have turned out differently. I drank for many years and I am completely certain that if I had not stopped drinking, I would have been dead by now.

Restlessness and parties

Thinking back, more than seven years after I drank my last drop of alcohol, I still cannot understand why I became an alcoholic. I can name the date when I stopped drinking, but not when I started. I'm no longer trying to find the reasons, because if I decide that it was something specific that got me drinking, then I'd risk a relapse if I experienced that situation or event again.

I can't say that there was anything particular during my childhood. OK, I had an uncle who drank, and another who committed suicide. But my childhood home was loving and caring. My sister and I wanted for nothing, and my parents had a quite conventional relationship with alcohol.

I've always been restless, however, and have always had to keep moving. My restlessness suited me just fine when I got to upper secondary school in the 1970s, because it was one big party for three years. I probably got drunk a little faster than other people. After secondary school – and after having worked at a factory – I travelled around Europe on a motorcycle for six months. I drank during the trip, but so did all young people. But I was probably drinking heavily even then.

> "There were so many times when I stood in front of the mirror at night and told myself that I wouldn't drink the next day. Nonetheless I started my morning by throwing up and starting to drink all over again."

When I started in the insurance business in 1979, it was normal to wear jeans and drink a few beers on Friday afternoons. It was also at that time that I developed my second disease – being a workaholic. We worked a lot, and this was a good excuse to go out and drink some beers when we finally got off work. But while the others went out maybe once a week, I started going out with different colleagues, so it suddenly turned into Wednesdays, Thursdays and Fridays. And it was OK to show up tired at the office the next day, because we did work a lot. During this time I was in and out of relationships. But at work, I managed to hide my growing alcohol consumption.

And yes, I've also tried being so drunk that I attempted to bash my way through a front door that wasn't mine, and I've been unable to hold my bladder and bowels.

It was all about drinking something strong

I met Brita 15 years ago. We were good friends, and we partied a lot together. We got married, and Brita stopped partying. But I kept going.

About ten years ago, Brita told me that it was getting to be too much. Some of my colleagues also told me that I smelled of booze. I ended up going to an alcohol therapist. It wasn't because I thought I had a serious problem – because I could easily manage my job – but mostly to get some peace and quiet from the people around me.

I went to the therapist for 18 months and did not drink in public for the entire time. Instead, I drank on the sly in order to avoid comments. I would run down to the store to buy cigarettes and would knock off a strong beer or two while I was out, or I would hide bottles in different places. I stressed about in order to find alcohol. If you saw a man in a park back then, wearing a suit and carrying a newspaper and a

Coke, that was me. Except the Coke was half-filled with liquor. It was all about drinking something strong, because I could get it down fast and no one would realize that I was gone.

I talked to the therapist a few times a week. I wouldn't drink the day before, but I always made sure to book an appointment in the morning so I could drink in the afternoon. I never drank while I was at work. But I had many sick days. And I could easily manage to be drunk several times in a day.

Alcoholics develop a way of moving people on quickly so that they can't ask too many questions. I just wanted to get my colleagues out of my office, so I immediately said yes to everything they asked me – and thus got more and more work. I turned into a recluse. I wasn't interested in anything but my own drinking. You become isolated. You don't have the energy to keep up a network.

There were so many times when I stood in front of the mirror at night and told myself that I wouldn't drink the next day. Nonetheless I started my morning by throwing up and starting to drink all over again. The alcohol therapist thought things were going better, however, and we reduced my visits to just once a week. That suited me just fine – then there was only one evening a week I couldn't drink.

Let me help you

In 2002 I got a new manager. He pulled me aside and said he could see that something was wrong. I told him it was just stress. He said, "OK, but I don't believe you. It's also something else."

Some time after this I got called into my manager's office again. The first thing I saw was his whiteboard, on which he had written, "We'd like to hold on to you – if you yourself are willing to help." Then he told me that someone very close to him had problems that he couldn't help with, but that he would like to help me if I would let myself be helped.

That's when the bottom fell out and walls started tumbling down. I was open that day and began to come out of denial. You don't know how grateful and happy I am that he had the will and courage to confront me, and that he chose the perfect day to do it.

My manager asked me to go home and talk to Brita. Two days later I received the nicest letter from him, with no moralizing or threats. It simply said, "It's so nice that you will let me help you," and told me whom I should contact to begin treatment. Not long after that I was on my way to an inpatient treatment centre where I would spend the next 5-6 weeks. I was sceptical. Alcoholics are people who sit on a bench and drink all day long – and that's not who I was. But I was surprised. It turned out to be people my age who also had family and friends. They were intelligent and they laughed for real – not the fake laughter I was used to in order to hide what was going on with me.

People with alcohol problems prefer to isolate themselves, so inpatients at the treatment centre share a room with someone else. I started by filling in a questionnaire about my drinking habits. I filled it in so everything looked just fine. My roommate looked at it and said, "You've completed it so you will get top marks. Rip it up and do it again, but this time do it for yourself and not to please someone else." So that's what I did – and it was the first step in 'moving out of the mouth and into the stomach'. I was ready to admit I had a problem.

The only people who knew where I was were my wife and my manager. As far as I knew, everyone else thought that I was absent because of stress.

Then suddenly one day I walked through the reception area and I saw my father-in-law. He had come to help his neighbour's daughter be hospitalized. He asked me what I was doing there, and just at that moment the director of the treatment centre walked out of her office door. She knew how reserved

I was, and when she discovered that it was my father-in-law, she thought it would be a good idea to tell him why I was there. So I had to tell him the truth. This also helped me overcome denial: now my drinking problem was out in the open. Was this a disaster? No, it was more of a relief.

If there is a higher power, then he has sent me some strange angels to teach me about admitting to and being open about my alcoholism: my manager, the director of the treatment centre, my roommate and my father-in-law!

Life is a gift

I returned home from the treatment centre on Friday 14 March, 2003. It's like coming out of an incubator with a backpack full of experiences. You can choose to step backwards into your new life with your backpack, and be annoyed about everything you have lost. Or you can step forward and focus on the positive things in life. I chose to step forward. I cannot change what has happened, but I've been able to find happiness again.

My manager had attended my discharge interview at the treatment centre and called me when I got home. My biggest fear about returning to work was that I had not been open about my problem. My boss suggested that I talk about it at a sales meeting for 30 salesmen a week after I returned to work. I walked into the meeting and said, "I have a new title to add to my business card." And then I wrote 'sober alcoholic' on the board.

I spoke for an hour, and after the meeting all I got was hugs and understanding. Two colleagues contacted me afterwards and told me that they also had problems with alcohol. This fits quite well with what people say – that about 10 per cent of us have problems with alcohol. Openness is also a process, a realization. I slept for 14 hours after the meeting. It was the first time in many years that I had been open and completely honest.

While I was in treatment, I wondered how I could function socially when I no longer drank. I would certainly not be so much fun anymore. But as treatment went on, I realized that I hadn't been fun at all. I had only thought about drinking.

I like my life more and more. I've started fishing again, and we have a dog that I bring with me into the countryside. I have the great joy of having become the father of a boy who is now 3½ years old, and our family also regularly takes care of a boy who is now five years old. This is a great gift – one I would not have been given when I was an alcoholic. Now I have family; when I drank, I was basically alone. I am so lucky that Brita stayed with me, that she was caring and stubborn and brave. What a gift I have received!

I was also able to be there for my mother during the last two years of her life when she was very ill with cancer. I would never have been able to do that while I was drinking.

Having stopped drinking doesn't mean that I don't have any problems, but I am now better equipped to tackle them. And I wouldn't trade one of my worst days now with one of my best days when I was drinking.

Alcohol dependence

- Alcohol is toxic to most body organs, which can be harmed by the intake of alcohol.
- Excessive consumption of alcohol can have serious social consequences, while also increasing the risk of developing a number of diseases such as cardiovascular disease, cerebral atrophy, stomach ulcer, liver cirrhosis and certain types of cancer.
- In the Western world, one in ten deaths is alcohol-related.

Acknowledging the problem is the first step

The Danish website Hope.dk reaches out to the half a million Danes who have a harmful consumption of alcohol.

Seven years ago Allan Jonas and a group of fellow students studying multimedia design had a good idea. They wanted to create an Internet-based information and counselling service for people with alcohol problems and their families. Members of the group had first-hand family experience, of one kind or another, with alcoholism or other addictions, and they were convinced that an anonymous counselling and information service could come in contact with an audience that the healthcare system did not reach.

"We were lucky to get the Blue Cross organization[1] to support the idea, and we got the site up pretty quickly. Before long we had up to 10,000 unique visitors a month," says Allan Jonas from Hope.

Acknowledgement, counselling, referral

"Our goal is to start a process that leads people to seek professional help," says Allan Jonas. "This might be a long road that typically goes from recognizing that one has a problem, through counselling, to getting in touch with a therapist. Our website helps people to acknowledge that they have a problem and provides counselling; when site users feel ready to seek treatment, they can find contact information covering 122 private and public treatment centres."

According to Allan Jonas, the advantage of the website is that people with alcohol problems and their relatives can get counselling anonymously. "The first, difficult step is admitting to yourself that you have a problem. You find that you are not alone with your problems and thoughts, and that it is possible to change things; other people have taken that path and have stopped their harmful consumption of alcohol. You have a problem, and you need help," he explains. "For many people this may be a long process that might involve several visits to our website, where they can read at their own pace."

The website offers several different approaches to knowledge about alcohol and its harmful effects. One can find information and statistics, and there is access to personal stories and a discussion forum where people can chat anonymously with others in similar situations. One can also send questions to an advisory board made up of alcohol treatment specialists, doctors and therapists specialized in helping relatives.

"Our success parameters are the number of people who send in questions to our consultants and the number who search for addresses of treatment centres," says Allan Jonas. "Of course, we don't know what happens afterwards, but at least the first step has been taken."

Harmful consumption of alcohol

Hope's target audience is not the most heavily addicted alcoholics. "The most heavily addicted are

About Hope

Hope is a Danish network established in 2003. It is operated by five organizations that have joined forces to foster good initiatives in the area of alcohol awareness.

A grant from the National Board of Health in Denmark has funded operations for the last 6-7 years. Hope also applies for grants from private foundations for development projects.

Recommended limit for alcohol consumption

The National Board of Health in Denmark has recently reduced its recommended limit for alcohol consumption to seven units per week for women and 14 for men. Drinking more than this increases the risk of over 60 different diseases.

not usually Internet users, and they will usually also be picked up somewhere else in the treatment system," continues Allan Jonas. "Our target group is the approximately 585,000 Danes who, according to the National Board of Health in Denmark, consume alcohol in ways that are harmful."

Harmful consumption of alcohol is characterized by drinking even when this causes social, personal and legal problems. The damages are thus both physical and psychological[2].

"Harmful drinking includes violence, drunk driving, broken relationships and the like – not only damage to the body and its organs," adds Allan Jonas. "Alcohol actually causes more harm than anything else – even more than drugs."

He points out that there are equal numbers of women and men who consume alcohol in harmful ways, and that these people are found in all socioeconomic groups. "But it is more hidden among women and in upper socioeconomic groups. It's important to reach the 'respectable group' – those who do not drink in public, but at home. The majority of this group are regular Internet users so we believe we can reach them with our website. These are people who still have jobs, families and friends, but their alcohol consumption is beginning to wear on them and their surroundings. We want to help them before their behaviour does irreparable harm to their children and spouses, and before they lose their jobs."

Others are happy to share their experience

From the beginning, Allan Jonas and his colleagues from Hope contacted people who were willing to write on the website about their experiences with alcohol. "Since then there have been more than 300 people willing to come forward and share their story on the site. We encourage people to use writing, because this helps them to clarify their own situation, and because their experience can also help others. Why do people want to help others? I think it is because recovering from harmful drinking is a long process; when you make it through to the other side, you are grateful and would like to help others to gain a better life as well," explains Allan Jonas.

"Our counselling, however, is done by professionals such as addiction treatment specialists working for a municipality. This is because professionals are familiar with a variety of treatment options, whereas people who have come out of a harmful consumption of alcohol will usually only know – and recommend –the method that they themselves used. This might not, however, be right for someone else, and we must not take any chances once a person is willing to get help and treatment."

Taking responsibility for those close to us

"It often starts with noticing that someone smells of alcohol and his or her behaviour begins to change," explains Allan Jonas. "A good friend should say something, but we often don't dare to do this, because it is taboo. It feels like a heavy accusation to ask a colleague: 'Don't you have an alcohol problem?' Can the relationship ever be the same once you've said that? We must, however, be willing to become involved. Even though there is a social safety net, this only begins to work after the damage has been done. We all have the responsibility to try to prevent things from progressing that far."

In Allan Jonas's experience, it often takes ten years from the time a person begins to drink in a harmful way until he or she enters treatment. It is, very often, a demand from someone close to the person that starts the process of acknowledging a drinking problem.

Still more to do

Allan Jonas is happy when Hope gets publicity that leads to more traffic on the website. "We know people visit our site because it is relevant to them, otherwise they would not be there."

When asked whether Hope has achieved its goals and can now rest on its laurels, Allan Jonas replies: "Now that the public information is working well we would like to see whether we can strengthen the more political side of our cause, for example by setting up a patients' association. And then there is the alarming fact that alcohol problems among the elderly are soaring. The elderly take the drinking habits of their youth with them, but they cannot tolerate as much alcohol as they get older. There are, for example, many falling accidents among older people. And since there are more and more elderly people, we are considering whether we should create a website specifically for them. As the WHO[3] representatives said at a recent conference: we can make knowledge available, but it is the NGOs who must spread it. So there is still much more that we can do."

1) Blue Cross Denmark is a Christian social organization that offers support, advice and treatment to the alcohol-dependent and their families
2) American Psychiatric Association – The Diagnostic and Statistical Manual of Mental Disorders IV
3) World Health Organization

The solution is in the brain

The secret behind alcohol abuse is buried deep in the brain – and it may also be here that the solution to the problem is waiting to be found.

Wim van den Brink

Wim van den Brink is professor of psychiatry and addiction at the Academic Medical Center of the University of Amsterdam. He co-founded the Amsterdam Institute for Addiction Research, where he has been director since 1995. Wim van den Brink has written or co-authored more than 350 international and 150 Dutch scientific publications and chapters in books. Wim van den Brink received the first Science Award by the Netherlands Psychiatric Association in 2005.

Some people experience a sensation of intense happiness while gazing at a beautiful sunset. Others ride a motorcycle or climb a mountain to get the same kick. And then there are those who have a hard time finding this rush of happiness and resort instead to drugs such as alcohol.

"All of these examples are caused by something happening in the brain," says Wim van den Brink, professor of psychiatry and addiction at the Academic Medical Centre at the University of Amsterdam, and co-founder of The Amsterdam Institute for Addiction Research. For years, Professor van den Brink has researched the brain mechanisms that can lead to substance abuse and dependency – including nicotine and alcohol, which he describes as the most dangerous to public health.

The intense joy that can be achieved in so many ways can be explained by a release of dopamine into the brain's so-called reward system. If the brain's dopamine production is too low, or if the brain contains too few dopamine receptors, then one runs the risk of becoming a sensation seeker, someone who seeks the feeling of intoxication. In this context, alcohol and drugs – next to sex – are the most potent means of achieving the necessary stimulation.

"Dependency is behaviour that can be defined as an urge that cannot be controlled. You drink more than you plan; you try to stop but cannot. This urge leads to loss of control, resulting in what we often call psychological dependency," says Wim van den Brink. "The urge is closely linked to the brain's motivational system, which is over-activated, while impulse control is under-activated."

"In the past, people believed that alcohol abuse was driven solely by physical withdrawal symptoms such as morning tremors. But this is not the case. Even many years after people have stopped drinking, they can easily relapse in a full alcohol dependence syndrome. Dependency is mainly associated with the brain's craving system, a conditioned memory system that can easily be re-activated after exposures to drinking-related situations, drinking a small amount of alcohol, or experiencing stress. Alcohol dependency is not directly related to a given level of alcohol consumption. It is highly individual. And although the volume of alcohol does, of course, influence dependency, one can in principle be dependent without abusing alcohol – and vice versa."

The role of genetics

According to Wim van den Brink, the risk of developing alcohol dependency is 50-60 percent genetically determined, as shown in a wide range of studies of identical twins.

But as these studies say nothing about which genes put people at risk, researchers have been looking for candidate genes for dependency for several years. They have discovered that the dopamine, serotonin, glutaminergic and opioid systems are particularly interesting. Genes linked to these areas appear to trigger the reward, craving and inhibition mechanisms capable of causing loss of control – and thus dependency.

"Now that we know the entire human genome, we can compare the genes of alcohol dependent persons to those who are not alcohol dependent in order to identify new, interesting genes."

"Now that we know the entire human genome," says Wim van den Brink, "we can compare the genes of alcohol dependent persons to those who are not alcohol dependent in order to identify new, interesting genes. But genes in themselves do not fully explain why some people have difficulty controlling their drinking. Both genetics and the environment play a significant role. Genetics make some people more likely to develop abuse and dependency, but there are other risk factors as well. We know, for example, that abuse and neglect during childhood often leads to a chronically disturbed stress-reaction system and to abuse and dependency later on in life. It is also known that low levels of response to alcohol are a risk factor. If you need to drink more than others to become drunk, and you don't get hangovers, then you risk becoming very fond of alcohol."

The world's most common drug

Alcohol is the most widely used drug and forms an integral part of social conventions in many cultures worldwide.

"Not all alcohol is harmful. Actually, a very moderate intake of alcohol is believed to prolong life in some cases. This is especially true for middle-aged and older men, for whom cardiovascular disease is an elevated risk. But in all cases, no more than one glass per day for women and less than two for men are recommended," says Wim van den Brink.

More dangerous than heroin

A number of researchers around the world – including those at The Amsterdam Institute for Addiction Research – have ranked alcohol as the absolute most dangerous drug in the world, ahead of cannabis, cocaine and heroin.

"In addition to the great risk of developing a dependency, there is a heavy risk of acute poisoning and chronic damage. Excessive alcohol harms virtually every organ in the body, and it is not a question of wine being better than beer or hard liquor. It is the alcohol and its metabolites that are harmful," says Wim van den Brink. "On top of all of this is the violence that often follows in the wake of alcohol use. This is extremely aggressive, and is

Facts about alcohol

- 23 million Europeans are dependent on alcohol in any one year
- 60 million Europeans have a harmful consumption of alcohol
- 2.5 million deaths per year are due to alcohol; of these deaths, one third is due to alcohol-related accidents
- On a global scale, the European Union (EU) has the highest proportion of alcohol users and the highest levels of alcohol consumption
- Russia and parts of Eastern Europe account for the highest incidence of alcohol-related deaths, while the Middle East, North Africa, India and Western Europe have the lowest
- 20-30 percent of all cases of cancer of the oesophagus, cancer of the liver, cirrhosis, homicide, epilepsy and traffic accidents are caused by alcohol.

Current treatments for alcohol abuse

The traditional remedy for alcoholism, Antabuse®, works by inhibition of the metabolism of alcohol in the liver, thus causing a toxic state and rendering ill those who drink. The new types of medication for alcohol dependency work by reducing the feeling of pleasure that comes from drinking alcohol, so alcohol loses its great attraction, or by reducing the feeling of craving.

evident in domestic violence, violence in nightlife, at football matches, etc."

Shuts down the pleasurable sensation

While alcohol consumption has increased in recent decades, so has our knowledge of alcohol.

"We find ourselves at a very interesting juncture in terms of research. Only now are we beginning in earnest to understand the various processes in the brain that lead to abuse and dependency. This also means that we can develop new drugs and new treatment methods for addicts," says Wim van den Brink.

Here he refers in particular to new drugs that affect the opioid system. These medications act as an alcohol antagonist, which, put simply, is a barrier that blocks the release of the pleasurable sensations triggered by endorphins during the ingestion of alcohol. It is thus possible to block the mechanism underlying dependency, so drinking simply becomes less interesting.

"The entire opioid system and the idea of shutting down the sensation of pleasure is quite interesting. It may well be that we cannot get the addicted to completely quit drinking. But perhaps we should start to think in a completely different way. There may be much to gain by lessening the damage instead of focusing 100 percent on abstinence. If we can get addicts to reduce their consumption from 50-100 drinks a week to 20-25, then we will have come a long way. In this way these people could regain control of their own lives. This would be a viable solution for certain groups of users."

Stimulation of the brain

There are other treatment options. Wim van den Brink mentions neuromodulation and deep brain stimulation.

"It was discovered in the 1970s that meditation could lower the heart rate. Similarly, it is believed that by using meditation and EEG[1] feedback, people can learn to manage some of the brain processes that are involved in dependency. People can strengthen their impulse control, for example, so they are better at saying no."

Deep brain stimulation, which uses electrodes to stimulate certain areas of the brain, is another possibility. This method has been used quite successfully to treat Parkinson's disease and obsessive compulsive disorder (OCD).

"If we can inhibit activity in the reward or craving system in this way, then we can break the underlying cycle of dependency. When this method was used on patients with obsessive thoughts, it turned out that people could stop drinking or smoking without any effort. Similarly, this method might be tested on seriously obese people."

"There is still no solid proof of the effectiveness of deep brain stimulation, but results are promising. Along with all the developments in brain and genetic research, it is quite clear that we are on the threshold of a very exciting time, with many opportunities to help addicts in completely new ways," concludes Wim van den Brink.

1) An electroencephalogram (EEG) is a test that measures and records the electrical activity of the brain

Melanie Baybut lives in the stunning beauty of South Africa's Western Cape. Three years ago, she was diagnosed with Chronic Fatigue Syndrome and depression. This is her story.

I felt like Sleeping Beauty

with no prince to rescue me

I am a 42-year-old woman, happily married with two children; a son aged 18 and a daughter aged 20. Life, like in any other household, is stressful at times, and we as parents are blessed to both have wonderful jobs. I work for a small engineering company with only three staff in total. I do drafting and really enjoy my work; I am very happy in my job.

My husband and I enjoy staying fit and I would say we are a healthy family. We only have a hospital plan as medical insurance and we hardly ever go to the doctor.

Sudden exhaustion

I actively started to play squash about three years ago, even competitively, and really enjoyed it. I was playing about 3-4 times a week when suddenly I started feeling very tired and exhausted after every game and even during a normal day. I went to the doctor thinking maybe my iron levels were low. He ran some blood tests and realized that my white blood cell count was as low as 1.7 and it should be 4-7. I started developing heart palpitations and suddenly my body shut down.

> "I felt like Sleeping Beauty but there was no prince to rescue me. I would walk around crying on the inside because I could not be there for my husband and children."

I was admitted to hospital for overnight observation. More tests were done and the diagnosis was that I had suffered from glandular fever several years ago and now had Chronic Fatigue Syndrome, also known as CFS.

The specialist at the hospital was not very sympathetic and told me to read about CFS on the Internet. I felt lost, lonely, tired and depressed at the same time.

I was physically so tired that I would get up for work just so that I could come back home and sleep again. I felt like Sleeping Beauty but there was no prince to rescue me. I would walk around crying on the inside because I could not be there for my husband and children. My friends stayed away because I would sleep all the time. I have the most beautiful nature right on my doorstep, but was no longer capable of going for walks. Going out at night or visiting friends was torture. I withdrew myself from everybody. I had no strength for anything.

My family was very concerned, as I am normally very bubbly and outgoing. I don't normally sleep during the day and then I was sleeping all day and all night.

For the first time in my life I did not have control over my life. I felt helpless. My daughter, then aged

Depression

- Depression is a common and partly hereditary disease with symptoms such as melancholy, loss of energy, difficulty concentrating and suicidal thoughts.
- Depression can strike anyone, but certain social and biological factors make some people more predisposed to this disorder than others.
- Patients have trouble holding on to their job and/or maintaining their family life and social contacts.

17, had to take over the household and that made me even sadder.

It was very hard on the whole family. To us, the mother is the home. If the mother is sick the whole house is sick. If the mother is sad, the whole family is sad.

CFS and depression go hand in hand

I was sad all the time because I was not in control of my body. Nothing I did could make me feel better. I also felt that I was being ungrateful. I had a wonderful and loving family and lived in such a beautiful place, and still I felt so sad.

I know now that CFS and depression go hand in hand. When the body shuts down the mind is also tired.

About a week after being given the CFS diagnosis, I consulted my house doctor. My doctor recommended antidepressants but knew that I was not keen on them for several reasons. Depression and addictions are part of my family history – I do not smoke or drink alcohol for that reason – and my father suffered from depression all his life. I did not want to go down that route.

I felt that I was betraying God, that I did not trust Him to help me, and I was afraid of being labelled. Yet I asked to be put on antidepressants. I was desperate. I tried to cope without but could not.

I was afraid that people would label me, and they did. People who have never experienced depression do not have empathy with someone who is suffering from it. I do understand that. Some friends told me they felt helpless because they have never been depressed in their lives.

Getting back to the life I enjoy

There is no cure for CFS except rest, eating healthily, limiting stress and being positive. I was desperate to get better but nobody knows how long it takes to get over CFS. I was told by the doctor that it could take up to 15 years. I did it within three.

I am now completely on top of things, with a full, active life. But I learnt to appreciate things much more; I no longer take it for granted every time I play squash, wash my dishes or go for a walk.

I hope that I will not have to depend on antidepressants for the rest of my life, but I now know that they are safe for me to use if I need them.

I urge everybody who is hit by illness not to give up; life is too precious, get help and fight it with everything within you. Don't give up hope; you can have a better life!

The silent disease

Although depression is one of the most common psychiatric disorders, it is still highly stigmatized. The stigma affects the individual patient, close relatives, and even a lot of physicians – and hinders efforts toward better treatment.

Koen Demyttenaere

Koen Demyttenaere is professor at the faculty of Medicine of the Katholieke Universiteit Leuven in Belgium and currently chair of the University Psychiatric Center at the university. Koen Demyttenaere is a specialist in depression and anxiety. His main interest fields are compliance with antidepressants, scales in depression and anxiety, quality of life and epidemiology of depression and anxiety. He has published over 190 international papers and book chapters, and he is member of several international advisory boards in the field of antidepressants.

Depression gets a lot of public attention, but the attention is almost always negative, mainly because of a negative attitude in the media towards antidepressant drugs. Patients themselves do not talk loudly about it, politicians focus almost exclusively on the suicidal risks connected with depression, and authorities are hesitant to subsidize new drugs.

This is despite the fact that depression, according to the WHO[1], affects at least 121 million people worldwide; that depression, since it renders so many young people unable to work, is the disease which, after heart disease, will incur the highest societal costs in the year 2020; and that depression is, in fact, a treatable disease.

"60 percent react positively after their first treatment with antidepressants," says Professor Koen Demyttenaere, a psychiatrist and specialist in depression and anxiety from Katholieke Universiteit in Leuven, Belgium. "And between 30 and 40 percent are completely cured. Before we decide whether this is a high percentage, we must first compare it to the treatment of other diseases, such as asthma, diabetes or obstructive pulmonary disease, where it is mostly a question of controlling symptoms," Koen Demyttenaere says.

Depression is now one of the most prevalent psychiatric disorders worldwide. The statistics are clear: four percent suffer from major depression, and up to eight percent will become depressed during their lifetime. Nonetheless, fewer than half of those who have depression seek treatment due to shame, lack of motivation or fear of stigma.

Nature or nurture?

The causes of depression are not clearly understood. That there are hereditary factors is known, but it has not been possible to identify a specific gene that might cause depression.

"Although brain research has not fully explained the psychopathology of depression, we know that neurotransmitters like serotonin, noradrenaline and dopamine – and maybe others – as well as receptors play a role. And that interfering with these can alleviate the symptoms of depression," says Koen Demyttenaere.

"The genetic influence could well play a direct role in provoking a depressive episode – or an indirect role through interaction with early life events. It has, for instance, been shown that people with too short alleles of the serotonin transporter gene have a higher risk of developing depression, but only when they have suffered from traumatic childhood experiences. Indeed, depression should be considered a bio-psycho-social disorder. Genetic and biological background, early childhood experiences, personality, coping skills as well as psycho-social circumstances all play a very complex role in causing as well as in curing depression," says Demyttenaere.

Depression is more than one disease

Koen Demyttenaere would like to see more research into the different subgroups of depression.

"Until now, depression has been treated as one disease, and antidepressants have been developed according to the maxim of *one size fits all*. This is

convenient for the authorities and pharmaceutical companies, but it is probably over-simplifying clinical reality. Clinicians have known for years that there are several types of depression, and they have tried to treat patients accordingly. They have been differentiating between for instance a retarded depression, anxious depression, melancholic depression, irritable depression, anhedonic depression etc[2]. However, we still need more scientific studies of these subgroups in order to make progress."

According to Koen Demyttenaere, another important step toward better and more effective treatment of depression is more systematic studies of what comprises optimal treatment. "What do you do when the first treatment does not work? From that moment on, evidence-based guidelines on what to do next are almost non-existent. If one compares practices in 20 countries, from initial treatment with antidepressants to more advanced combination treatments with or without psychotherapy, and eventually to electroconvulsive therapy (ECT) – which is still regarded as a very effective treatment – you will see that this varies widely from country to country. Doctors feel their way forward, and practice has no scientific foundation."

Where are we now?

The latest generations of antidepressants have been making progress, but more in regard to safety and tolerability than to efficacy. There is a growing awareness of areas of improvement: most of these antidepressants have sexual side effects, cause long term weight gain, and although some patients do feel much better when taking these antidepressants, they do not regain their zest for life. One could say that the currently available antidepressants are indeed more efficacious in reducing negative effect than in increasing positive effect. Another major problem is that many patients do not continue to take their medication as prescribed, partly due to side effects and partly due to psychological factors such as fear of dependence or stigma," explains Koen Demyttenaere.

Stigma gets in the way

One of the main obstacles blocking a more effective fight against depression is the stigma associated with the disease. This stigma not only presents a major burden for the individual patient, but also plays a significant role when society must prioritize which diseases it will attempt to battle.

"The stigma of depression is alive and well, even though no one will officially admit to this," says Koen Demyttenaere. "Just look at how difficult it is to get subsidies for new antidepressants. We live in a world of limited resources, where everyone is competing for funding. In this competition for

resources, depression does poorly compared to diseases such as cancer. Depression is still perceived as the disease of 'weak people' or 'those with no backbone'. How much we should spend on the treatment of depression depends on how broadly we look at the cost of depression. Indeed, it has been documented that in terms of indirect costs, depression is one of the singlemost costly disorders for society due to loss of productivity through absenteeism – where people are absent from work, and presenteeism – where they are present, but perform poorly."

Inadequate education

Like other mental illnesses, depression also comes up short in the competition for medical education resources.

"Medical education needs substantial improvement when it comes to psychiatry," claims Koen Demyttenaere. "In Belgium, medical school takes seven years, out of which psychiatry gets 22 hours of theory, ten hours of clinical application and three weeks of clinical practice, which is low when you consider the high prevalence of depression. Nonetheless, general practitioners treat 78 percent of patients with depression. Everyone agrees that something should be done about this. But nothing happens because more hours for psychiatry would mean fewer hours for another area, and nobody wants to surrender resources."

New research

The Belgian psychiatrist hopes for a better understanding of and better treatment of depression. He believes this will only be realized through a better exchange between the psychological sciences and the neurosciences.

"Some people are rather disappointed by the fact that the exciting findings from neurobiological research up to now have only had a minor impact on the way psychiatrists treat patients in their daily practice," says Demyttenaere. "I believe that one of the reasons is that neuroscience groups are not enough in touch with clinicians, who have a greater knowledge of psychopathology, although the discussion of subtypes of depression and on important outcome measures in treatment are a step in the right direction".

"We are only beginning to understand the underlying mechanisms of this disease. It is important that research continues – and improves – so we can help even more people in the fight against depression. No matter what we do, we must not give up. There will always be patients who can be helped by new drugs and new therapies," he concludes.

1) World Health Organization
2) See box on depression subtypes

Facts about depression

- 121 million persons worldwide suffer from depression
- Depression can be diagnosed and treated effectively
- Fewer than 25 percent of persons suffering from depression have access to treatment
- Typical symptoms of depression: Low mood, inability to feel happiness, sleep problems, lack of appetite with resulting weight loss, slow movements and speech, fatigue, difficulty concentrating, profound feelings of guilt, suicidal thoughts.

Depression subtypes

AGITATED DEPRESSION
Anxious and restless, cannot keep still

ANXIOUS DEPRESSION
Has higher levels of anxiety and worry

ATYPICAL DEPRESSION
Comfort eating instead of loss of appetite, sleeps significantly more than usual; mood worsens during the day

IRRITABLE DEPRESSION
Marked irritability, is on edge

MELANCHOLIC DEPRESSION
Severe depression with marked sleep disturbances

MASKED DEPRESSION
Depression is hidden behind symptoms such as fatigue, headache, muscle or stomach pains and digestive difficulties

RETARDED DEPRESSION
Characterized by slowing down, anergia and psychomotoric retardation

ANHEDONIC DEPRESSION
With marked lack of enjoyment and pleasure

Mental health is not a given

Fortunately, there has in recent years been increasing focus throughout the world on better access to health services. Japan and Colombia are examples of countries where access to treatment of brain disorders is improving.

Colombia

"Health should not be merchandise"
Psychiatrist Rodrigo Córdoba

Lundbeck in Colombia

Japan

"I have never regretted my choice"
Psychiatrist Teruhiko Higuchi

Lundbeck in Japan

I have never regretted my choice

It is well known that developing countries have scant resources for psychiatry. But even in a high-income country such as Japan, psychiatrists must work with far fewer resources than their colleagues dealing with somatic diseases. Psychiatrist Teruhiko Higuchi, president of Japan's National Center of Neurology and Psychiatry, typically has three hours to treat 30-40 patients.

Tokyo is bustling with people and traffic, but a few aspects of urban life are conspicuously absent. One does not hear cars honking angrily, or see people quarrelling with each other or shoving their way through the streets as one does in other large cities.

Social norms in Japan place great value in controlling individual impulses in favour of 'wa', or community harmony. Mentally ill people deviate from 'wa', however, and their condition pulls not only themselves, but also the community out of balance.

In the past, therapies deeply rooted in traditional Japanese culture were used to restore social harmony. Psychiatrist Teruhiko Higuchi mentions Naikan Therapy, 'looking inside therapy', as an example. Unlike Western therapies, this form of therapy does not encourage the patient to explore his or her individual needs. Rather, it is based on a Buddhist philosophy that the patient will feel better by reflecting on his or her close relationships in order to rediscover a sense of community. There are still Naikan care centres in Japan, but they are now of less importance.

Today, Japanese psychiatrists treat their patients in the same way as their counterparts in the rest of the industrialized world. But psychiatry is underprioritized, and general practitioners' training in modern psychiatry is inadequate. According to Dr. Higuchi, this has serious consequences for patients.

It must have been the hot weather

Dr. Higuchi is president of the National Center of Neurology and Psychiatry (NCNP) in Tokyo. The centre is unique in Japan in that it is a hospital and a research institution at the same time. Among its many activities, the centre offers training for the entire range of psychiatric care personnel: psychiatrists, psychologists, nurses and general practitioners. General practitioners, in particular, have a great need to upgrade their knowledge of the latest developments in the treatment of mental illnesses, says Dr. Higuchi.

He relates that one million or more patients risk receiving incorrect treatment because doctors have too little knowledge and experience to recognize and diagnose mental illness – particularly depression. The reason for this problem begins in medical school. During their six-year education, medical students have 20 hours of instruction and a two-week internship in a clinic to familiarize themselves with the field of psychiatry. The time medical students have to learn about depression, which has doubled in prevalence in ten years, is just two or three hours of instruction. And those few lessons could end up being their only resource, explains Dr. Higuchi. "If the student happens to be assigned depression during the internship, he or she is lucky. If not – the young general practitioner will start out with no clinical experience of depression at all."

He explains how treatment typically takes place. The patient goes to the doctor believing that something is physically wrong. The doctor takes a series of tests and treats the patient's physical symptoms, for example with ulcer medication. Then, when test results come back they show nothing abnormal. Dr. Higuchi throws out his hand and smiles. "And then the doctor concludes: 'It must have been the hot weather!'"

When Dr. Higuchi finished medical school and was about to choose his residency, mental illness was associated with a deep sense of social shame. Psychiatrists often neglected to inform patients and their families about a diagnosis of 'schizophrenia' in order to protect them from social stigma. Alternatively, they chose to camouflage the serious psychiatric diagnosis with a diagnosis of 'neurasthenia'. This diagnosis is more acceptable, and focuses on physical symptoms such as headache, dizziness and sleep disturbances.

As a young medical student, Dr. Higuchi planned on specializing as a surgeon or a paediatrician. But during the semester in which he studied psychiatry, he met a professor who made such a deep and inspiring impression on him that he changed his mind. "A surgeon focuses on how to remove the disease, the sick organ," says Dr. Higuchi. "He does not focus on the human itself. I understood that we need to take care of the patient holistically and right after the course I knew I was going to be a specialist in psychiatry."

The most important progress

When Dr. Higuchi looks back on his thirty-year career, he finds that the most significant progress has occurred in the general change of attitudes concerning mental illnesses. Whereas these previously were perceived as incurable character flaws, they are now viewed to a much greater extent as diseases that can be treated. The Japanese Society of Neurology and Psychiatry, in particular, has made great efforts in the fight to remove the stigmas associated with serious mental illness. In 2002 the organization took an unusual step, and simply renamed the clinical term for schizophrenia. The Japanese word for schizophrenia, 'mind-split disease', basically labelled patients as hopelessly sick. But the new term, 'integration disorder', expresses that the illness can be treated and that recovery is possible. This renaming was a success. A study shows that only 37 per cent of patients were informed of their schizophrenia diagnosis in 2002. By 2004, this figure rose to just over 70 per cent.

Dr. Higuchi also points out another step forward. An increasing number of local mental health clinics have opened in neighbourhoods, and they are easy to visit after work. While it is generally acceptable to be physically ill, many patients are still bashful when it comes to seeking help for mental illness. Thus, when a pharmaceutical company launched an antidepressant, it referred to depression as 'kokoro no kaze', or 'mental colds'. And Dr. Higuchi relates that clinic signs do not openly advertise that they offer psychiatric help. "The billboards say 'psychosomatic clinic' or 'sleep clinic'; this is much softer and the patient will feel able to come," he explains.

The biggest challenge

There is not progress on all fronts, says Dr. Higuchi. Japan is the world's third-largest economy, and has a large health budget. Like other industrialized countries, however, Japan spends only around five per cent of its total health budget on mental health services. And there are far too few psychiatrists to deal with the increasing number of patients. The latest figures report 9.4 psychiatrists per 100,000 inhabitants. Dr. Higuchi feels the effects of this low prioritization in his own practice at NCNP. He tries to give first-time patients a consultation of between a half and a full hour. But from then on, time is so scarce that he must typically see 30-40 patients in three hours. "It is a fact that time is more limited than in the seventies," he says.

Japan also has the world's highest number of psychiatric hospital beds and number of hospitalization days. Traditionally, this has been due to the lifelong hospitalization of patients with serious mental illnesses. In contrast, most Western countries have made great progress in closing large psychiatric hospitals in favour of community-based care. In Japan, however, 90 per cent of psychiatric hospitals are privately owned. According to Dr. Higuchi, and to the WHO[1], this is why change takes place so slowly. In his view, the transition to community-based care is the most urgent challenge facing psychiatry.

The NCNP is heavily involved in efforts to facilitate this transition. Among other initiatives, the centre has spearheaded a number of pilot projects that develop up-to-date programmes such as outreach services and the rehabilitation of long-term hospitalized patients.

Things are moving in the right direction, says Dr. Higuchi. Hospital days for newly diagnosed patients have been reduced in recent years. At the same time, he warns about a new challenge. Twenty-four per cent of Japan's population is 60 years old or more, and the number of patients with Alzheimer's disease and other dementia diagnoses is growing. This patient group is currently surging into hospitals and taking up empty beds.

"We may see the same challenges with Alzheimer's patients as we did with patients with severe mental illnesses. And the growing number of Alzheimer's patients may indeed inhibit the phasing-out of the large psychiatric institutions," he explains.

Some challenges are solved, and new ones present themselves. During his career, Dr. Higuchi has experienced great changes in Japan's way of perceiving and treating mental illnesses. But there is one thing he can say about his years as a psychiatrist: "I have never regretted my choice."

Teruhiko Higuchi, M.D., Ph.D.

Selection of positions and memberships

- President of the National Center of Neurology and Psychiatry
- Director of the Japanese Society for Mood Disorders
- Vice President of the Japanese Society of Clinical Neuropsychopharmacology

Research interests

- Mood disorders[2]
- Psychopharmacology
- Biological psychiatry

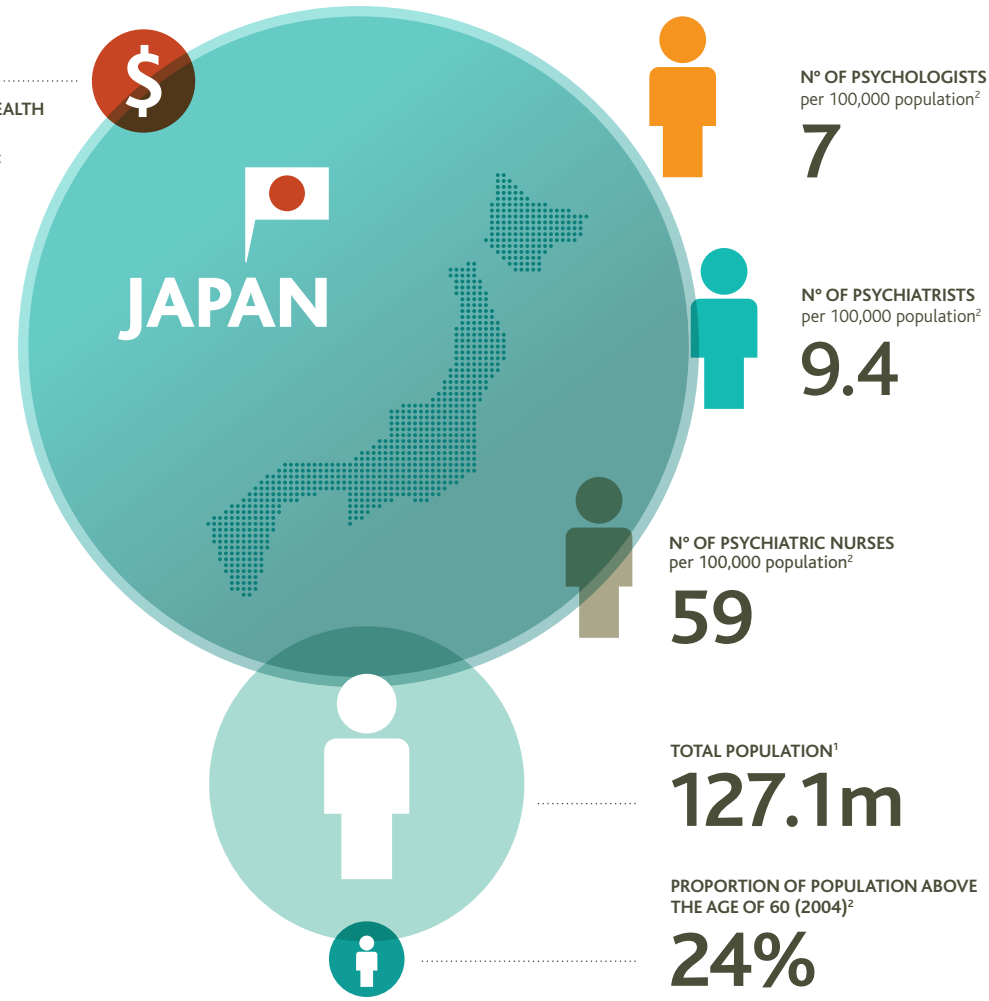
1) World Health Organization
2) Mood disorders include a series of conditions characterized by substantial changes to mood, e.g. depression and mania

PSYCHIATRIC BEDS
per 100,000 population[2]

284

USD 2,514

TOTAL EXPENDITURE ON HEALTH PER CAPITA (2006)[3]
Expenditure on mental health: 3% of total health budget[2]



Nº OF PSYCHOLOGISTS
per 100,000 population[2]

7

Nº OF PSYCHIATRISTS
per 100,000 population[2]

9.4

Nº OF PSYCHIATRIC NURSES
per 100,000 population[2]

59

TOTAL POPULATION[1]

127.1m

PROPORTION OF POPULATION ABOVE THE AGE OF 60 (2004)[2]

24%

MENTAL HEALTH IN JAPAN – FACTS AND FIGURES

Availability of mental healthcare services
All residents are insured by the national healthcare system, typically covering up to 70% of the cost of services. Some vulnerable groups, such as children, the elderly and those with chronic mental illnesses are exempted from co-payment.[2]

Accessibility of mental healthcare services
Mental health is part of the primary healthcare system. Treatment of severe mental disorders is available in secondary care and the major share of psychiatric care is typically provided by private psychiatric hospitals with very long in-patient stays. Currently, The Mental Health Welfare Law encourages reforms to deinstitutionalize in favour of community-based services.[2]

Sources:
1) Danish Foreign Ministry (2009)
2) WHO Mental Health Care Atlas
(all data from 2005 unless otherwise stated)
3) WHO Country Information

Michael Vilhelmsen,
General Manager in Japan 2007-2010

Lundbeck in Japan

Therapy areas
The Japanese drug approval system is one of the strictest in the world and requires long term planning and investment from all foreign pharmaceutical companies. Lundbeck has prepared its presence in Japan in two ways: Mochida Pharmaceutical Co., Ltd has conducted a series of successful Japanese clinical trials for Lexapro® (escitalopram) for the treatment of depression in collaboration with Lundbeck, and a new drug application for escitalopram was submitted with the Japanese authorities in 2010. Lundbeck is currently researching new compounds to be used in the treatment of depression in collaboration with partner Takeda Pharmaceutical Company Limited.

General Manager Michael Vilhelmsen
"In recent years, patients with mood disorders[2] have reaped the benefits of a surge in drug development. But several of the new generations of antidepressants and other psychopharmaceuticals have not been available to Japanese patients. The Japanese health authorities are committed to reducing the so called 'drug lag' in order to meet a growing need for cutting-edge treatment. With Lexapro®, patients in Japan will have access to the same quality of treatment as patients in Western countries.

Lundbeck wishes to set up educational programmes for mental healthcare staff in Japan and support the interaction and sharing of knowledge between local general practitioners, community care clinics and psychiatric institutions."

Office established
2001

Nº of employees
13

Health should not be merchandise

Colombia is the scene of the bloodiest ongoing conflict in Latin America. More than 40 years of fighting between drug cartels, insurgents and the government has left deep scars on the mental health of many Colombians. However, just 16 percent of the population have access to qualified medical help. Psychiatrist Rodrigo Córdoba would like to change this.

Rodrigo Córdoba, psychiatrist and government advisor

Past and current posts include

- President of Colombia's National Association of Psychiatry
- President of the National Association of Scientific Societies
- Director of Clínica Campo Abierto

Research interests

- Anxiety disorders
- Schizophrenia

The main road of Colombia's capital, Bogotá, is pitted with potholes that gather pools of rain water and mud. Motorists, accustomed to the bad roads, barely slow down as they manoeuvre through traffic to avoid the ruts. When cars stop at a red light, street peddlers rush to hawk peppers or feather dusters. But the road leads to an oasis: beyond the gates to psychiatrist Rodrigo Córdoba's clinic Campo Abierto lies a low building with patients' drawings hanging on the walls, a garden with old trees, a football pitch. It almost looks like a home.

A legacy

Dr. Córdoba has unique, first-hand knowledge of psychiatry in Colombia. His father was a psychiatric pioneer who co-founded Colombia's National Association of Psychiatry in 1961, at which time, according to Dr. Córdoba, psychiatry in Colombia barely existed. "My father's mission was to bring psychiatric help to the local communities, to rescue the patients as human beings and to make the medical community recognize psychiatry as an exact science." Dr. Córdoba inherited his father's struggle. Like his father, he works in a society where people are vulnerable to mental disorders, especially post-traumatic stress. Within the last ten years alone, the armed conflict in Colombia has claimed over 40,000 lives. Two million citizens are 'desplazados', or internally displaced persons. And many more are victims of – or have witnessed – gross violations of human rights including murder, torture and kidnapping.

The last is being eaten by ants

But far from all mentally ill people get help when they need it. About 16 percent of Colombians, typically salaried employees and their families, have comprehensive health coverage provided by private insurance companies. The majority of the population, including farm workers, the poor and the unemployed, has no health insurance. Internally displaced persons are covered by public health insurance for a few months only, and then must fend for themselves. Access to medical care for uninsured Colombians is very limited; if they receive medication, it is the cheapest generic version from China or India. Dr. Córdoba illustrates the situation with some striking statistics. "Four out of ten people suffer from anxiety disorders," he says. "But only one out of ten in need of help receives treatment. That kind of prevalence shows that mental health is a public and a government issue."

Indeed, the WHO[1] points out that Colombia faces major challenges in providing more and better public healthcare. But private insurance companies are in charge of large parts of the health sector, and initiatives in promoting healthcare or prevention are not in the hands of the government. This makes Dr. Córdoba indignant. He believes that insurance companies impose themselves between patients and doctors. "We must rescue health as a fundamental right of all people," he says. "Health rights are connected to human rights. Health should not be merchandise!"

If only one out of every ten Colombians with anxiety disorders gets help, what about the nine who receive neither diagnosis nor treatment? What becomes of them? Dr. Córdoba throws out his arms. Who knows? They are not covered by any medical safety net, and nobody cares about what happens to them. Perhaps they reduce their symptoms by abusing alcohol and narcotics. Maybe they seek out alternative practitioners, witches and shamans. And he guesses at their fate with a quote from the Colombian Nobel laureate in literature, Gabriel Garcia Márquez: "The first in line is tied to a tree, and the last is being eaten by ants."

The brain rules everything else

The special Colombian insurance system makes it more difficult to help people with psychological disorders, says Dr. Córdoba. But it is not only a

question of resources. It is also a matter of priorities. Mental health typically ranks low on the political agenda in Latin American countries. This is why medical care for mentally ill patients is not integrated into the primary health sector, according to the Pan American Health Organization (PAHO), the WHO's regional office in the Americas. The primary health sector refers to general practitioners, who are usually the patient's first contact with health authorities. It is the local doctor's task to recognize psychatric symptoms, diagnose, treat and perhaps hospitalize or make a referral to a specialist. Dr. Córdoba says that many more general practitioners are needed, especially to care for the large proportion of the population living outside major cities. But because they work under harsh conditions and typically earn the same as a hairdresser, such physicians are difficult to recruit.

The PAHO recommends reforms to strengthen primary care in the fight against severe undertreatment of mental disorders in Latin America, and this reprioritization is a key issue for Dr. Córdoba. "Mental health is the motor for quality of life, for individual and social transformations. The brain rules everything else."

The future is promising

It now appears, however, that the goals for which Dr. Córdoba and his father before him have fought for so long may finally be achieved. The government's policy of confronting the drug cartels has improved domestic security, foreign investors are arriving, and the economy is growing. There is now the political will – and strength – to improve the primary sector as well as the quality and scope of public health coverage. The government is working on a major healthcare reform, and Dr. Córdoba is the spokesperson for the group of doctors cooperating with the government to prepare the reform plan. On his desk, a computer competes for space with stacks of papers, files and books. What is the most urgent task, here and now? Dr. Córdoba responds that it surely must be the improvement of primary care and the training of doctors to diagnose mental disorders. And fighting the taboos associated with mental illness. And improving the quality of care given to mentally ill patients. He smiles wryly: naming the most urgent task became a list of many tasks. "I like results to come quickly! But the process is slow, and we must work for the long term," he says.

When Dr. Córdoba told his family that he had chosen to specialize in psychiatry, his father was very proud. And does Dr. Córdoba have a son of his own? His face breaks into a satisfied expression. "I have two sons," he says. Could it be that they will take over after their father? He smiles broadly. "It's possible!"

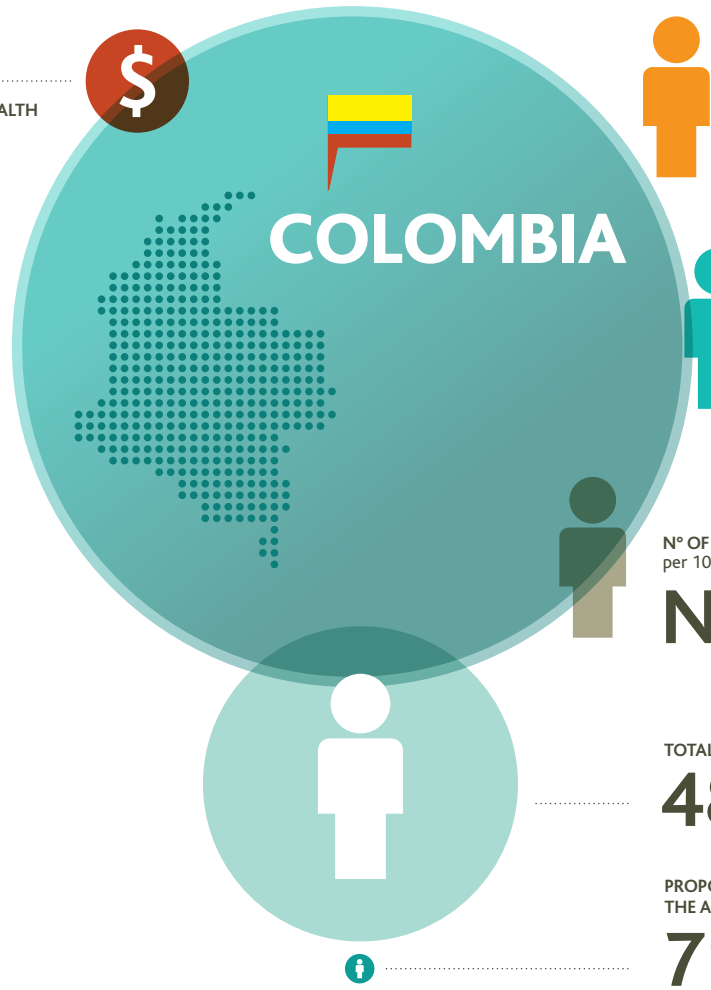
1) World Health Organization
2) The Lundbeck Institute is an international education forum whose mission is to improve the quality of life for persons affected by psychiatric and neurological diseases

PSYCHIATRIC BEDS
per 100,000 population[2]

4.5

USD 626

TOTAL EXPENDITURE ON HEALTH PER CAPITA (2006)[3]
Expenditure on mental health: 0.08% of total health budget[2]



Nº OF PSYCHOLOGISTS
per 100,000 population[2]

N/A

Nº OF PSYCHIATRISTS
per 100,000 population[2]

2

Nº OF PSYCHIATRIC NURSES
per 100,000 population[2]

N/A

TOTAL POPULATION[1]

48.3m

PROPORTION OF POPULATION ABOVE THE AGE OF 60 (2004)[2]

7%

MENTAL HEALTH IN COLOMBIA – FACTS AND FIGURES

Availability of mental health care services
Mental healthcare is provided in accordance with the individual's insurance or social security and is not part of primary healthcare.[2]

Accessibility of mental health care services
Psychological and psychiatric consultations are not available in the wide majority of the municipalities across the country.[4] NGOs offer mental health-care to displaced persons, women and children, sometimes through mobile clinics in rural areas.[2 4] But according to Dr. Córdoba, their efforts have limited impact on overall demand.

Sources:
1) Danish Foreign Ministry (estimate 2009)
2) WHO Mental Health Care Atlas (all data from 2005 unless otherwise stated)
3) WHO Country Information
4) Médecins Sans Frontieres, *Mental Health in Colombia: How big is the problem?* 2005

Commercial Manager Mauricio Mendoza

Lundbeck in Colombia

Therapy areas
Lundbeck offers treatment of depression, anxiety disorders and Alzheimer's disease in Colombia. Lexapro® is the market leader.

Partnerships and CSR projects
Lundbeck is developing patient materials and continued education programmes for doctors in close cooperation with Colombia's National Association of Psychiatry and the Colombian Association of Neurology.

Commercial Manager
Mauricio Mendoza
"We're the youngest Lundbeck subsidiary, and our main responsibility is to build relationships with physicians, government institutions, clients and patient associations that will be of long term value. Colombian psychiatrists have a tradition of being oriented toward US research. But European evidence and guidelines are increasingly recognized because of their high quality and integrity. In the future, we will strengthen our endeavours through collaboration with the Lundbeck Institute[2], which is highly regarded by our stakeholders. Among other things, we plan to organize scientific update meetings for specialists and to establish mentor programmes for young psychiatrists."

"One of our key goals is to protect patients against relapse and assure that these patients return to a normal life. Patients with depression and anxiety diagnoses should be in treatment for at least six months, but here in Colombia, treatment is typically discontinued after three months because the patient feels better and does not receive follow-up consultations. We know that patients become more vulnerable after every relapse, and that their pathology becomes more complex and difficult to treat. This is why it is very important for us to communicate how essential continuous efforts are for the patients' future – in terms of both quality of life and economic costs."

Subsidiary opened
2009

Nº of employees
12

I'm fine, Dad

Life changed dramatically for the Todds when their son Adam started having seizures at the age of three. Despite years of seizures, bad falls and setbacks, Adam has remained a happy and active child, and a recent trial of a new medication has given the family new hope.


LONDON FOG

Adam Todd was a thriving three-year-old beginning his first year of pre-school, full of laughter and smiles, learning new things on a daily basis. He could recite the story of *The Three Little Pigs* in French and was eager to show off his skill for an audience. He was a happy, active boy who loved to run, and his future was filled with possibilities.

Early one morning in 2002, Adam woke up feeling mildly ill and his parents, Sara and Dale Todd, decided to keep him home from pre-school. His symptoms were vague and rather mild, but he just didn't seem like himself. By mid-morning Adam wasn't feeling any better and Dale decided to take him to the doctor. "I didn't know what was going on," recalls Dale. "He was incredibly lethargic and things didn't seem right."

Adam's doctor examined his ears, eyes and throat and found he had a low-grade fever and that his throat was a little red. His doctor gave him some antibiotics assuming it was a slight infection. By the time the Todds had left the appointment, Adam was exhausted. When they arrived home, they put him down for a nap so that he could rest. Once Adam was tucked in, Sara decided to go for a short run while Dale stayed to watch over Adam.

When Sara returned, she walked into the house and it was silent. "I could just feel something was wrong," she says. "I started walking up the stairs and I could hear Dale frantically talking to someone on the phone. The first thing I heard him say was 'Okay, he's breathing now!' I flew up the stairs and that's when Dale told me that he thought Adam had a seizure."

Adam was limp and clammy on the bed, but had started to come around. Moments later the ambulance arrived and the paramedics rushed into the house.

> "It was only two weeks after these terrifying events had begun, when I heard those two words – Lennox-Gastaut – and I knew that our lives would be changed forever."

Just as they were trying to calm and comfort the Todd family, Adam went into another seizure…unconscious, stiff and shaking, and his lips turning blue.

"I remember the paramedics ripping Adam's clothes off and rushing him out to the ambulance in a blanket," recalls Sara. "Our neighbours were in their front yards with tears running down their faces. They saw little Adam being carried away wrapped in a blanket, and nobody knew what was going on."

The long wait for answers

When the Todds arrived at the hospital, the emergency room doctor told them that Adam would need to have some tests including a lumbar puncture to help determine the cause of the seizures. The paediatrician arrived to perform the procedure and suddenly Adam had two more seizures there in front of her. Scared and uncertain, the Todds waited anxiously while the lumbar puncture was performed.

The family stayed in the hospital for several days so Adam could be observed and more tests could be run. Each test came back negative, providing no answers. "We were hoping that what Adam had experienced were febrile seizures, which a lot of children have," said Sara. The Todds were sent home with the hope that the seizures were an isolated occurrence related to Adam's slightly elevated temperature.

Back at home the Todds tried to resume their everyday activities and Adam went back to his pre-school seeming somewhat improved. They had scheduled an EEG[1] a week later to see if they could get more answers. The day of his test, Dale and Sara picked Adam up from his pre-school, got him happily into his car seat and started driving to his appointment at the hospital. Adam was singing when suddenly he had another seizure in his car seat. They raced to the hospital emergency room and the EEG was immediately performed there. After reading the

About LGS

Lennox-Gastaut syndrome (LGS) is a rare and severe form of epilepsy responsible for 1-4 percent of all childhood epilepsies. Onset of LGS typically occurs between two and eight years of age with the seizures usually continuing through adulthood. Eighty percent of those with LGS will have continued seizures throughout childhood and into their adult years. LGS can take an enormous toll on the physical and developmental health of the patient, as well as the well-being of the patient's family, due to severity of seizures, frequent injuries, developmental delays and behavioural problems.

test, the neurologist came to speak to Dale and Sara. "Well, the bad news is that Adam has epilepsy," he said. "But the good news is that with medication, most people can control their seizures. Sometimes they stop having seizures altogether. "With that information the Todds were cautiously optimistic; they had a name for Adam's condition and a course of action. They started him on some anti-seizure medication and he was hospitalized again for several days.

When they returned home Adam was not his usual self. He was lethargic and weak. His balance was poor and he wasn't able to complete tasks that had always come easy. "Adam was a master at puzzles and had been since he was a toddler," says Sara. "He could do puzzles upside down. He just saw them differently. His skill was amazing." After the seizures began, Adam would take two puzzle pieces and just hit them together as if he didn't know what to do with them. "It felt like he was slipping away," says Sara, "as if we were losing our child right before our eyes."

Lives changed forever

As Adam continued to struggle, the Todds went back to the neurologist to try to find more answers. Once seated in his office, he told them that while it was premature to give an official diagnosis before having all of the facts, the characteristics that he saw Adam experiencing seemed to suggest an epilepsy syndrome called Lennox-Gastaut.

"It was only two weeks after these terrifying events had begun," Dale recalls, "when I heard those two words – Lennox-Gastaut – and I knew that our lives would be changed forever."

After a change of medications, Adam then went 14 straight months without a seizure. "We thought we had it licked," Sara remembers. "It was as if we could put the events in the past and say that when Adam was three and a half, he had a few seizures and it was horrible, but it's over now. Then, out of the blue in November of the following year, actually the day of my birthday party, Adam had two tonic-clonic seizures[2], and our hearts sank."

Within the next month Adam endured more than 20 tonic-clonic seizures "We had to be with him constantly," says Sara. "We never knew when one would strike. Everything had changed – we even had to help him stand." When the Todds were told that this was the best they could hope for with their son's epilepsy treatment, they asked to be referred to an epilepsy centre.

Doctors at the epilepsy centre had Adam try new medications and eventually the ketogenic diet[3]. "Both seemed to help somewhat," says Sara, "but our new normal became a life full of seizures, which was a huge adjustment for all of us."

Fearing for Adam's safety

As time went on, Adam started having drop seizures or drop attacks, which can be the most debilitating of the Lennox-Gastaut syndrome seizure types because the sudden loss of muscle tone results in repeated falls and subsequent injuries to the head and face.

"As a man, and as a father, you think that there has to be a reason and answer," says Dale. "You'll do anything; go anywhere, just to see if someone can help your son. We were searching for a silver bullet, and with epilepsy, some find it. The sad part is that some people don't."

"The drop seizures were terrifying and we couldn't let Adam do anything by himself," says Sara. "He wanted to run, explore playgrounds and walk up the stairs to his bedroom by himself." Dale and Sara quickly realized that they needed to have someone with Adam at all times for his safety. "Having to watch Adam unexpectedly fall to the ground from a drop seizure was the most violent and scary thing I've seen," says Dale. "Worse yet, they always seemed to happen when Adam was having the most fun."

With the onslaught of Adam's seizure activity, his learning and development was impacted. He was no longer keeping up with his peers or learning in the same way as the rest of his class. Adam's developmental delays were becoming more apparent and he was getting left behind.

"Only a short time earlier our child was saying nursery rhymes in French and learning with ease," says Sara, "then he was unable to put a sentence

"With his drops currently behind him, 11-year-old Adam was able to complete his first five-kilometre race, running the entire distance by himself, with his dad by his side."

together." Not only were the effects of the seizures devastating, but so were the side effects of the medications. Lethargy, tremors, insomnia, distractibility, poor appetite, constipation and drooling were just some of the symptoms that his parents began to see.

Lost childhood

"This is a mean disorder," says Dale. "It robs children of their youth and instils fear in all those around. If you are a parent of a child with Lennox-Gastaut you start to develop keen senses where you can tell the difference between when your child is in bed just moving the sheets around, or having a seizure. You gain an uncanny ability to hear the sounds of a seizure from almost any place in your house — it's unlike anything you've heard. It's the sound of every muscle in the body tightening at once and forcing air out from the larynx. Just imagine hearing it 4-5 times a day, it does things to you."

Adam was having drop seizures almost everywhere he went; in the bathroom, on the stairs, at school, in the playground, at church. "We had to put him on the ground or floor almost everywhere we went, and we were always hanging on to him," says Sara. "We tried several different helmets to protect his head and none of them were great. They made him hot and he hated to wear them," she says. "But we had no choice," says Dale.

They constantly paid attention to what kind of surface Adam was on. "He frequently had a black eye from a fall. He has scrapes and scars all over his body, and places on his scalp where hair won't grow from his frequent injuries. "We had to tell Adam 'no' to things that he loved to do, and with this loss of freedom, he was losing his childhood," says Dale. "We had to balance safety with his need to be a child, learning and exploring."

"We couldn't get a babysitter," says Sara. "We ultimately lost our day care provider because they told us that they didn't have the ability to care for him any more." With their lives upended, Dale became depressed. "We were going all around the Midwest to comprehensive epilepsy centres, in search of whatever was out there that could stop the drops, and it was physically and mentally anguishing for all of us," he says. "As a parent I felt powerless. I would

hold my son and literally feel the electricity surge through his body, and I was helpless. My son was having constant seizures and I was losing him and myself at the same time."

Improving quality of life

The frequency of Adam's drop seizures was increasing and nothing was working to stop them. The Todds learned of a paediatric epilepsy specialist in Chicago and, hopeful, they made the journey to see her. When they told her Adam's story, she said "I want to help make the *quality* of Adam's life better." She told them that Adam would be a perfect candidate for a clinical study that she felt held promise.

"We enrolled in the study and the results were dramatic," says Sara. "From the moment he began taking the medication, Adam's drop seizures stopped. Finally, after so many years, we were able to exhale." While damage from his seizures remains, with that very first pill the Todds' lives were changed. "If you see a child go a few weeks without a seizure you can see amazing changes, and when that happens, I get my son back," says Dale.

"Doctors have told us that historically the prognosis for children with Lennox-Gastaut syndrome is not great in terms of seizure control and developmental progress," says Sara, "but also that they don't know Adam's potential. He has made progress on several fronts over the last couple of years. And if this medication continues to stop his drops, that adds to his quality of life in a huge way."

Dale and Sara say that Adam has always been happy when he is running. "The only time when we could safely let him run was on a beach or for Sara and me to run next to him, holding on to him in case he had a drop seizure," says Dale. With his drops currently behind him, 11-year-old Adam was able to complete his first five-kilometre race, running the entire distance by himself, with his dad by his side. He crossed the finish line with a big smile on his face and proudly proclaimed "I did it!" He even took third place in his age division, winning five dollars, which he promptly spent on hot chocolate and a cookie.

"Through it all, I learned a lot about my son and how tough he is," Dale said. "He was having 4-5 drops a day, where his entire body would smack the ground hard. Adam would always pick himself up and when I'd ask how he was, he'd say, 'I'm fine, Dad.' Just when you think that you have it tough, you look at this child and think about all that he has been through in his short life and he makes you remember what's important. He makes you smile."

"There is no roadmap," says Sara. "That's the hard part. It's a bit of trial and error, but you keep searching and you try to surround yourself with the best support network that you can, and you don't give up."

1) An electroencephalogram (EEG) is a test that measures and records the electrical activity of the brain
2) Generalized tonic-clonic seizures (grand mal seizures) are the most common and best known type of generalized seizure. They begin with stiffening of the limbs (the tonic phase), followed by jerking of the limbs and face (the clonic phase). www.epilepsyfoundation.org
3) The ketogenic diet is a special high-fat, low-carbohydrate diet that helps to control seizures in some people with epilepsy. www.epilepsy.com

Collaboration to speed up drug development

Lundbeck has recently entered into several new collaborations to speed up the development of new and improved drugs. One of them is NEWMEDS, where pharmaceutical companies join forces with academic institutions.

It is widely recognized that despite tremendous growth in biomedical knowledge and an almost daily round of discoveries, the rate of development of new drugs has been slow. This is especially true in psychiatric disorders. One barrier to development has been that the real causes of many brain disorders are still unknown and the other has been the limited exchange of science between the pharmaceutical industry and academic institutions.

Unique collaboration

One answer to the challenge is the NEWMEDS – Novel Methods leading to New Medications in Depression and Schizophrenia – collaboration. The collaboration was established in late 2009 and is unique in that it brings a cluster of nearly 50 scientists together to work on the common goal of more rapidly achieving better, safer and more effective medications.

The project, which is funded by the Innovative Medicines Initiative (IMI), and the European Union (EU), is led collaboratively by Lundbeck and King's College London and brings together top scientists from seven academic institutions and major global pharmaceutical companies including AstraZeneca, Eli Lilly, GlaxoSmithKline, Lundbeck, Janssen Pharmaceutica, Novartis, Orion, Pfizer, Roche and Servier.

Towards tailor-made drugs

Peter Høngaard Andersen, Executive Vice President of Research at Lundbeck explains how the NEWMEDS collaboration will help Lundbeck develop new and improved treatments for brain disorders. "The discovery of new drugs for treatment of brain disorders has traditionally been based on clinical observations of symptoms, because we still don't know the real causes of many brain disorders. However, over the last few years, research has generated new and promising knowledge about disease biology and about the biological relationships and mechanisms that are believed to be the fundamental causes of many brain disorders. This makes it possible to develop drugs that target the underlying mechanisms of a disease, and not only treat symptoms more effectively but also alter the course of the disease."

Peter Høngaard Andersen elaborates: "For example, currently, people suffering from diseases such as depression and schizophrenia are treated as a homogeneous group, but from a biological point of view they are a heterogeneous group and should be treated accordingly with different treatments. Therefore future drugs need to be tailored to biologically defined groups of patients instead of a *one size fits all* treatment. The NEWMEDS project seeks to use the knowledge about disease biology to discover new tailor-made treatments based on the disease biology itself."

Traditionally, it takes 20 to 30 years before anyone sees the real benefit of research investment. Peter Høngaard Andersen expects the NEWMEDS project to show benefits at a faster pace: "This project is particularly unique in that the activities are being carried out in different parts of the value chain. And patients may reap the benefits in as little as five to ten years because we are able to do things collaboratively much faster in this project than if we were to carry out the activities by ourselves."

Largest dataset in the world

In the area of depression, the NEWMEDS partnership aims to determine why some patients respond to one kind of antidepressant and others do not. While efforts have been made by individual academic groups and individual companies to look into this, results are based on limited numbers. By pooling

together the resources of public sector projects with trials from three pharmaceutical companies, NEWMEDS has brought together data on the genetics and clinical response in over 1,800 patients.

This is now the world's largest resource of well-characterised patients with depression who have been treated with different antidepressants, and allows for analysis of who responds best to which.

"NEWMEDS finally gives us a big enough, powerful enough sample to address how genetics influence antidepressant response," says Tine Bryan Stensbøl, Divisional Director for Synaptic Transmission Research at Lundbeck and coordinator of the NEWMEDS consortium. "This could lead to significant changes in the way we select patients for trials, and in the long run how we select treatments for individuals."

The NEWMEDS academic lead, Professor Dr Shitij Kapur, Dean and Head of the Institute of Psychiatry at King's College adds, "We have so far been able to amass the largest database in the world to advance drug development in depression and schizophrenia, and we hope that this will help alleviate to some extent the drought of new drugs in psychiatry."

Long lasting research

Shitij Kapur adds, "One of our focus areas is to develop new animal models which use brain recording and behavioural tests to identify innovative and effective drugs for schizophrenia. We will examine how new genetic findings – duplication and deletion or changes in genes – influence the response to various drugs and whether this information can be used to choose the right drug for the right patient. And we will develop new approaches for shorter and more efficient trials of new medication; trials that may require fewer patients and provide faster results."

Tine Bryan Stensbøl stresses that the project operates in a pre-competitive environment: "The participating pharmaceutical companies are of course also competitors, so that is why the NEWMEDS projects address areas that can be of benefit to all participants. For instance by bringing together data from clinical trials run by the individual companies to use in new areas of research relevant not only to the academic institutions but also to the industry going forward. We have all been doing trials the same way and using the same statistical approaches. By bringing together this large dataset we have a unique opportunity to see whether patients are somehow different. We will be able to identify if trials could be smaller, faster and can decrease exposure of patients to experimental medications, and this will be of benefit to not only the pharmaceutical companies but also to the patients in need of new and improved medication."

Peter Høngaard Andersen
Executive Vice President of Research at Lundbeck

Tine Bryan Stensbøl
Divisional Director for Synaptic Transmission Research at Lundbeck and coordinator of the NEWMEDS consortium

Professor Dr Shitij Kapur
Dean and Head of the Institute of Psychiatry at King's College

About NEWMEDS

Novel Methods leading to New Medications in Depression and Schizophrenia (NEWMEDS) is a novel approach to drug discovery and collaboration. The consortium, funded by the Innovative Medicines Initiative (IMI), and the European Union (EU) is led collaboratively by Lundbeck and King's College London. The participating pharmaceutical companies will match the funding as in-kind contributions.

Pharmaceutical companies: AstraZeneca, Eli Lilly, GlaxoSmithKline, Lundbeck, Janssen Pharmaceutica, Novartis, Orion, Pfizer, Roche and Servier.

Academic institutions: Karolinska Institutet (Sweden), The University of Cambridge (United Kingdom), Central Institute of Mental Health (Germany), CSIC (Spain), the University of Manchester (United Kingdom) and the Bar Ilan University (Israel).

Furthermore, deCODE (Iceland) and Psynova (United Kingdom) will contribute to the research, while GABO:mi (Germany) is managing the project.

From idea to patient

Distribution of drugs

Lundbeck's drugs are registered in more than 100 countries. Lundbeck's own representatives are in charge of spreading the knowledge of Lundbeck products in 57 countries. As Lundbeck products are prescription drugs, doctors must decide when patients will benefit from them. Lundbeck spreads knowledge of its products through publications in scientific journals, participation in scientific conferences, and through meetings with doctors and specialists.

Production of drugs

A drug must be safe and efficacious. It must also be possible to produce it in large amounts and in a manner that enables patients to take the drug and assimilate it optimally in the body. Lundbeck manufactures its own drugs in Denmark, France, Italy and Mexico. Lundbeck also collaborates with a number of other companies on various phases of the production process, ranging from supply of raw materials and semi-finished products to pharmaceutical production and packaging of the drugs.

700m

700 million in the world

According to the World Health Organization (WHO), more than 700 million cases of disorders of the central nervous system[1] are reported each year. These are serious and life-threatening illnesses that affect not only patients' quality of life, but also that of their families and friends. For society in general, the major economic consequences caused by these conditions make it important to develop new and innovative drugs. During the past 50 years, novel drugs have revolutionized the possibilities of treatment. However, there is still a huge unmet need for new and innovative drugs.

1) Lundbeck uses brain disorders synonymously with the central nervous system (CNS)

From idea to drug candidate

Lundbeck has research units in Denmark and the United States. The basis for a new and innovative drug is deep insight into the disorder itself, and into the unmet needs of patients. The process takes between three and five years, during which researchers work to identify where in the human organism a new drug must act and to test substances for efficacy, side effects and toxicity. If a substance passes all of these tests, it becomes a drug candidate.

From candidate to approved drug

Lundbeck conducts the development activities that are necessary for a drug to be approved in some 40 countries around the world. First, a substance is tested in healthy persons for its tolerability, assimilation and distribution in the body. Following this, its efficacy and side-effect profiles are tested in a small group of patients. In the third and decisive phase, the drug is tested in a large group of patients. Developing a new drug is very demanding, and normally takes between eight and ten years.

Lundbecks history

COMPANY MILESTONES


Hans Lundbeck


Poul Viggo Petersen


Grete Lundbeck


Lumsås, 1961

1915-1929

The first years as a Danish trading company
Hans Lundbeck founded an agency in Copenhagen on 14 August 1915. The company dealt in everything from machinery, biscuits, confectionery, sweeteners, cinema equipment and cameras to photographic paper and aluminium foil, besides renting out vacuum cleaners. During its first years, the business was operated as a trading company, but, from the mid-1920s, pharmaceuticals were added to its range of products. Eduard Goldschmidt was hired in 1924, bringing into the company a number of new agency contracts for drugs: suppositories for haemorrhoids, painkillers etc. Cologne and creams were also added to the portfolio.

1930-1944

Expansion in manufacturing and research
In the 1930s, Lundbeck began production and packaging of pharmaceuticals in Denmark. To ensure sufficient manufacturing capacity, the company moved to the Copenhagen suburb of Valby in 1939, where Lundbeck headquarters is situated today.

Hans Lundbeck died in 1943, and Poul Viggo Petersen was employed to build up Lundbeck's pharmaceutical research. Thanks to his efforts, Lundbeck was able to create a niche for itself in psychopharmaceuticals.

1945-1959

The foundation of Lundbeck's expertise
During the years following World War II, Lundbeck intensified its research, laying the foundation stone for the drugs which would later make Lundbeck world famous. In 1954, Mrs Grete Lundbeck, the widow of Lundbeck's founder, established the Lundbeck Foundation for the purpose of ensuring and expanding Lundbeck's business operations, as well as for providing financial support for primarily scientific objectives and the fight against diseases.

1960-1974

Expanding Lundbeck goes international
Lundbeck's success with Truxal® for the treatment of schizophrenia increased the need for additional production capacity. In 1961, Lundbeck purchased a former creamery in Lumsås and soon began production of active compounds. Between 1960 and 1970, the number of employees doubled to 680, of whom approximately 100 were employed abroad. Lundbeck was becoming an international company.

PRODUCT MILESTONES

1937 Epicutan®
Lundbeck launches its first original drug, Epicutan® for the healing of wounds.

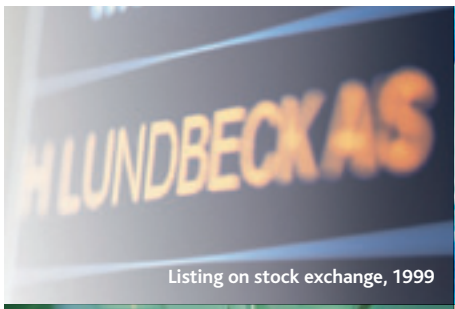
1940 Lucosil®
Lucosil® is launched for the treatment of urinary tract infections.

1959 Truxal®
Truxal® is launched for the treatment of schizophrenia.

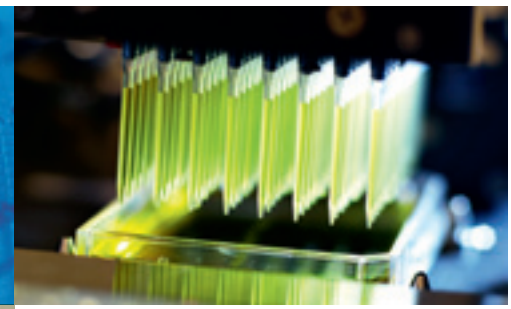
1960-75
During these years, a number of drugs for the treatment of psychiatric disorders were launched.

1989 Cipramil®
Cipramil® is launched in Denmark for the treatment of depression and plays a large role in Lundbeck's expansion.

1996 Serdolect®
Serdolect® is launched for the treatment of schizophrenia.

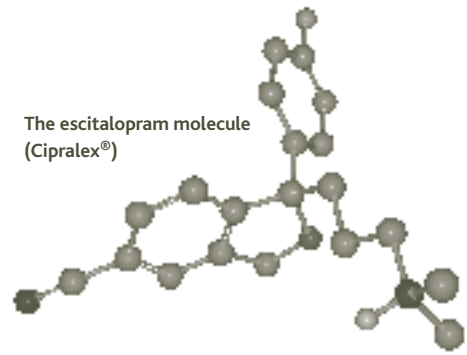


Listing on stock exchange, 1999




Ampoule production, 1990


Lundbeck Research USA, 2003


The escitalopram molecule (Cipralex®)

1975-1989

Lundbeck defines CNS[1] as its primary focus
After 60 years of growth and development based on a wide assortment of products, Lundbeck decided at the end of the 1970s to phase out its existing agencies and cosmetics departments. After that, the company would focus on development and commercialization of drugs.

At the close of the 1980s, Lundbeck further intensified its business strategy focus. In future, Lundbeck would dedicate its efforts to development, manufacturing and commercialization of drugs for the treatment of diseases and disorders of the central nervous system (CNS).

1) Lundbeck uses brain disorders synonymously with the central nervous system (CNS)

1990-2004

Expansion propelled by Cipramil® success
Lundbeck expanded rapidly in the 1990s, due to the success of Cipramil® for treatment of depression. Cipramil® was registered in more than 70 countries and grew to account for the major share of Lundbeck's business operations.

To ensure its continued success, Lundbeck intensified its research activities and began in-licensing drugs from other pharmaceutical companies. This enabled Lundbeck to launch new drugs to take over when the patents on other drugs expired.

In 2003, Lundbeck acquired the American research company Synaptic, thereby establishing a research unit as a bridgehead in the United States.

2005-

Global presence
In 2009, Lundbeck acquired Ovation Pharmaceuticals, Inc., establishing Lundbeck's own platform in the United States, the world's largest market for pharmaceuticals. Lundbeck also acquired Elaiapharm in France, thereby increasing the company's production capacity. At the end of 2010, Lundbeck had more than 5,900 employees in 57 countries.

2002 Cipralex®
Cipralex® is launched for the treatment of depression and soon becomes Lundbeck's leading drug.

2003 Ebixa®
Ebixa® is launched for the treatment of Alzheimer's disease.

2005 Azilect®
Azilect® is launched for the treatment of Parkinson's disease.

2008 Xenazine®
Xenazine® is launched for the treatment of chorea associated with Huntington's disease.

2009 Sabril®
Sabril® is launched for the treatment of epilepsy.

Lundbeck at a glance

LUNDBECK FACTS

- Lundbeck is a specialty pharmaceutical company engaged in the development of pharmaceuticals for the treatment of brain disorders on the basis of in-house research.
- **A global pharmaceutical company** with a presence in nearly all parts of the world and with competencies and activities throughout the value chain: research, development, production, marketing and sales.
- **Founded in 1915** by Hans Lundbeck, the company was listed on NASDAQ OMX Copenhagen in 1999.
- The largest shareholder is the **Lundbeck Foundation, which holds 70% of the shares.** In 2010, the Foundation donated DKK 385 million for scientific research.
- **5,900 employees in 57 countries**[1].
- Revenue was **DKK 14,765 million** in 2010.
- **Approx. 20% of the revenue is reinvested in research and development** of new and innovative pharmaceuticals for the treatment of brain disorders.

1) Number of employees, including part-time employees at the end of 2010

PRODUCTS

Cipralex®/Lexapro®
Depression and anxiety

DKK 8,251 million

Ebixa®
Alzheimer's disease

DKK 2,403 million

Azilect®
Parkinson's disease

DKK 1,028 million

Xenazine®
Huntington's disease

DKK 610 million

Sabril®
Epilepsy

DKK 179 million

Other pharmaceuticals

DKK 2,036 million

LUNDBECK WORLDWIDE

PARENT COMPANY
Denmark

PRODUCTION
Denmark
France
Italy
Mexico

RESEARCH
Denmark
USA

SALES
EUROPE
Austria
Belgium
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Ireland
Iceland
Italy
Latvia
Lithuania
Netherlands
Norway
Poland
Portugal
Romania
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
UK

INT. MARKETS
Argentina
Australia
Belarus
Brazil
Canada
Chile
China (incl. Hong Kong)
Colombia
Egypt
India
Indonesia
Israel
Japan
Malaysia
Mexico
Pakistan
Philippines
Russia
Saudi Arabia
Singapore
South Africa
South Korea
Turkey
Ukraine
United Arab Emirates
Venezuela

USA

INSTITUTES
The Lundbeck Institute

LUNDBECK'S VALUES

"Imaginative" underlines a need for daring to be different. Lundbeck believes in the necessity of being open to new knowledge and alternative solutions.

"Passionate" refers to a long-standing tradition of never giving up. Lundbeck has met with setbacks – and will meet them again – in the effort to find new treatments of brain disorders.

"Responsible" means that Lundbeck employees are expected to do the right thing and act responsibly towards colleagues, the environment and the external community.

OUR VISION AND MISSION

Lundbeck's vision
Our vision is to become a world leader in psychiatry and neurology.

Lundbeck's mission
Our mission is to improve the quality of life of people suffering from psychiatric and neurological disorders.

THE LUNDBECK INSTITUTE

- The Lundbeck Institute is an international education forum whose mission is to improve the quality of life for persons affected by psychiatric and neurological diseases.
- The Institute has an associate faculty of 82 highly respected psychiatrists and neurologists from around the world. Since it was founded in 1997, 4,200 specialists from 65 countries have participated in Lundbeck Institute seminars in Denmark. In addition, seminars are currently offered in 32 countries worldwide.
- The Institute's Internet community DepNet has been launched in 18 countries. It offers persons with or affected by depression the opportunity to obtain information and advice from leading psychiatrists, and to discuss their experiences with each other. www.CNSforum.com.

RESEARCH AND DEVELOPMENT

Lundbeck is engaged in research and development of new and innovative pharmaceuticals for the treatment of:

- Alcohol dependence
- Alzheimer's disease
- Depression/anxiety
- Epilepsy
- Parkinson's disease
- Psychosis
- Stroke

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