Emergent BioSolutions Inc Analyst and Investor Day

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CORPORATE PARTICIPANTS

- Abigail L. Jenkins, Emergent BioSolutions Inc. - SVP of Vaccines Business Unit Head
- Adam R. Havey, Emergent BioSolutions Inc. - Executive VP of Business Operations
- Atul Saran, Emergent BioSolutions Inc. - Executive VP of Corporate Development, General Counsel & Corporate Secretary
- C. Douglas White, Emergent BioSolutions Inc. - Senior VP & Head of Devices Business Unit
- Laura Saward, Emergent BioSolutions Canada Inc. - Chief Scientific Officer
- Laura Saward, Emergent BioSolutions Inc. - SVP & Head of Antibody Therapeutics Business Unit
- Richard S. Lindahl, Emergent BioSolutions Inc. - Executive VP, CFO & Treasurer
- Robert G. Burrows, Emergent BioSolutions Inc. - VP of IR
- Robert G. Kramer, Emergent BioSolutions Inc. - CEO, President & Director
- Sean Kirk
- Sean M. Kirk, Emergent BioSolutions Inc. - EVP of Manufacturing & Technical Operations
- Syed T. Husain, Emergent BioSolutions Inc. - Senior VP & CDMO Business Unit Head

CONFERENCE CALL PARTICIPANTS

- Boris Peaker, Cowen and Company, LLC, Research Division - MD & Senior Research Analyst
- Brandon Richard Folkes, Cantor Fitzgerald & Co., Research Division - Analyst
- Dana Carver Flanders, Guggenheim Securities, LLC, Research Division - Senior Analyst
- James Francis Molloy, Alliance Global Partners, Research Division - MD of Equity Research and Biotechnology & Specialty Pharmaceuticals Equity Research Analyst
- Jessica Macomber Fye, JP Morgan Chase & Co, Research Division - Analyst
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PRESENTATION

Robert G. Burrows, Emergent BioSolutions Inc. - VP of IR

Ladies and gentlemen, good morning. Can you hear me okay? There's a little reverberation. Good. Good morning, everybody. My name is Bob Burrows. I'm Investor Relations Officer for Emergent BioSolutions. Thank you for being here at the second Analyst and Investor Day for Emergent BioSolutions over our 21-year history. This is a very exciting day. You'll hear that phrase often throughout the day, but indeed, there's a lot going on in Emergent, and we're thrilled to have an opportunity to tell you the current and future growth story of Emergent.

So obviously, this is all going to be webcast. We will be making forward-looking statements. Please refer to our filings. We also have a reconciliation table at the end of the slide deck. There's even a glossary that we have in the slide deck as well for lots of the acronyms that we live by as well. So this will be recorded and then archived on the website, a copy of which will be available after the event, okay?

And so for the day, we're going to spend the next couple of hours together discussing again the growth story and the growth strategy for the company over the next 5 years, starting with, of course, my esteemed colleague, Bob Kramer, who will take you through that strategy; followed by Adam Havey, who will take you through the markets and customers; followed by then a series of our BU heads, starting with Abbey Jenkins for the vaccines business unit; Laura Saward for the therapeutics business unit. We'll have a Q&A session at the conclusion of that tranche of presenters. It will be about 20 minutes. We'll have a break. And we'll come back at around 11:00 and continue with the other 2 BU leads Syed Husain and -- actually, Sean Kirk, who will introduce you to our newest colleague Syed Husain running the CDMO business unit. And then finishing up and batting cleanup will be Doug White, who leads our Devices business unit. So again, running through each of the BUs, which you all are familiar with, then followed by a discussion on M&A by Atul Saran, and then lastly but certainly not least, my colleague, Rich Lindahl, who will take you through the financials. Bob will come back, and then we will have a Q&A at the end, and we'll break and conclude and then segue to the lunch. And we should be all wrapped up by 2:00 p.m., okay?

So without further ado, let me bring forward my esteemed colleague, Bob Kramer, to begin the day.

Robert G. Kramer, Emergent BioSolutions Inc. - CEO, President & Director

Thank you, Bob, and good morning, everybody. The management team and I are super excited to spend some time with you this morning and share with you our thoughts on the state of the business today and, most importantly, our vision and view of what we hope to accomplish with the business over the next 5 years.

As we meet today, we find ourselves in a unique position of unprecedented strength in the business overall. And by that, I mean, first of all, over the last 6 months, we've put in place over $3 billion worth of long-term procurement contracts to support our medical countermeasures portfolio that includes $2 billion for our ACAM2000 smallpox vaccine; $0.5 billion for our smallpox therapeutic product VIG; $0.5 billion in support for our botulism antitoxin, BAT; and then $216 million of contract value for our second-generation anthrax vaccine candidate, AV7909 that's being exercised by BARDA.

In addition to the contracts that we've recently put under a long-term contract with the government, we successfully executed on our 2016 through 2020 growth strategy in a number of areas. It's not just the $1 billion in revenue that we're projecting for 2019, but it's also the acquisitions that we've accomplished over the last 2 years. You've heard about those, but just to state them clearly, it's the ACAM2000 acquisition we made in Q4 of 2017; it's the raxibacumab product; the anthrax monoclonal product we bought from GSK in the same time; a year later, we acquired the PaxVax travelers' vaccine business, which Abbey will talk about; and most notably, the NARCAN nasal spray business, which we acquired almost a year ago today. Those 4 acquisitions in the aggregate have contributed over $600 million of annual run rate to our business that we had just 2 years ago. As a result of those acquisitions, plus our organic business, we now are in a position where we have 3 different business lines contributing over $250 million of revenue on an annual basis. If you have been following us and with us for a while, you know that that's pretty significant revenue growth and diversification from where we were just 7 years ago when BioThrax as the single product contributed 80% of our revenue on a going-forward basis.

The other thing that we've been successful in accomplishing over the last several years is a complete integration of all of our operations throughout all of our sites. You'll hear that from Syed as well as from Sean in a few minutes.

And lastly, I think the piece that I'm most excited about is the fact that we have significantly strengthened our leadership team, many of which you'll hear from today. So it's my hope and my setup here that you are as enthusiastic and optimistic about our future going forward than the management team and I will hope to convey today because we're really in a unique position of an opportunity and an inflection point for the business.

I want to quickly revisit for you and summarize our vision and mission. This has been a constant for our 21-year history. We aspire to be a Fortune 500 global life sciences company recognized for protecting and enhancing life. That mission of protecting and enhancing life has been a constant since we began the business in 1998 and drives everything we do and everything that our 1,800 colleagues do around all of our locations.

We are a bit of a unique company. Some have referred to us as an acquired taste. We have earned our stripes through a lot of hard work over the 21 years and earned a reputation for being a very credible, reliable partner to our patients, customers and colleagues with which we partner.

What sets us apart are a couple of things I want to focus on. First of all, we have consistently been able to build and scale leadership positions in the growing and expanding public health threat market in which we operate. In a few minutes, Adam will come up and share with you the details and the contours of that growing and expanding public health threat market. But going back to when we started the business in 1998, when it was just BioThrax, we quickly established a leadership position in the chemical, biologic, radiological, nuclear and explosive, or CBRNE, threat space. We then turned to the travelers' health area, and as Abbey will go through later this morning, our building leadership positions across that travelers' health space, both with the products that we acquired a year ago from PaxVax, which is our Vaxchora and Vivotif marketed products, but also, importantly, our chikungunya vaccine candidate that is Phase III-ready, and Abbey will talk about that shortly as part of her presentation.

The other thing that we've done more recently is to jump into the opioid crisis with our acquisition of NARCAN nasal spray a year ago. We see a significant opportunity for us to leverage our capabilities and competencies in the 21-year history and leverage that to come up with solutions for complex public health threats like the current opioid crisis. And you'll hear from Doug about our strategy for expanding the impact of NARCAN nasal spray in that opioid crisis market.

I thought it would be helpful to do just a quick recap of -- before we get into what we expect from the business over the next 5 years, just to set the stage for you in terms of what we've been able to accomplish over the first 21-year history of the business. We started the business in 1998 with the acquisition of some assets from the State of Michigan, which most notably included BioThrax, the only FDA-licensed vaccine that protects against Anthrax. As with most start-ups and spin-offs, it was a little ugly in the beginning. It was extremely challenging taking over of manufacturing facility that was previously owned by the State of Michigan and was underinvested and underserved. We survived those early days by focusing on quality-minded manufacturing, delivering and meeting expectations to the FDA, to the Department of Defense, the Health and Human Services and the Department of Homeland Security.

We also invested a significant amount of capital in our infrastructure, including a $75 million investment in a state-of-the-art manufacturing facility in Lansing, Michigan, the same campus, in order to meet the worldwide demand for BioThrax as well as our second-generation anthrax vaccine candidate, AV7909. During that first 10- to 12-year period, we also made and built extensive relationships across multiple agencies within the federal government, not just in the Department of Defense, not just in HHS or Homeland Security, but throughout all the major federal agencies. That has served us well. As you all know, we have a portfolio of grant and contract revenue that we typically support on an annual basis that generates somewhere in the neighborhood of $100 million of revenue annually. Those relationships are key for us. They start out in the development nature and can often lead to long-term procurement contracts as with AV7909.

The other thing that we did during this first 12 years of the business is to partner and to establish a reputation as a dependable, reliable partner to the government for very unique medical countermeasures like our portfolio that we'll review. The other thing we did toward the end of this period is go public. So it was important for us to establish a firm financial foundation from which to grow. So as we look to the second step of our growth strategy, what we call the build stage, which occurred during 2012 through 2015, we had the financial wherewithal to grow and leverage and scale the business.

We challenged the organization to essentially double revenue in this 2012 through 2015 period from under $280 million in revenue in 2012 to over $500 million in revenue by the end of 2015. We also established a profitability metric where we wanted to generate net income of greater than 15% growth per year. And importantly, to drive diversification in our customer and patient base, we wanted a metric by which we will be generating revenue from more than 3 products by the end of that 2015 period.

As you can see from the slide, we significantly exceeded each of those goals such that by the end of 2015, our revenue was in excess of $500 million. We had a compound annual growth rate for net income, which was closer to 33%, almost double the rate that we targeted of 15%, and we had a significant number of products generating meaningful revenue in the portfolio, far greater than 3.

The challenge to the organization at the end of 2015 was what do we do next, what do we do in the next 5-year period. The challenge to the organization was to once again double revenue to over $1 billion by the end of 2020, was also to that in a profitable way by committing to a net income margin of 14% or greater. And this time, we wanted more than 10 products generating revenue and contributing to the top line plus we wanted revenue from a growing CDMO business unit, which Syed will talk about here in a few minutes. And on top of that, we challenged the organization to deliver 6 advanced-stage development candidates in order to fuel growth well beyond the 2016 through 2020 period.

As we sit here today toward the end of 2019, about to wrap up the year, we're on track with the revenue, we're on track with net income margin, we're on track or exceeding with the marketed products as well as the CDMO services, and we're on track with our 6 advanced-stage candidates. So the question is kind of what do we do next. Just a snapshot of the company as it is today. We have 1,800 employees in 19 locations around the globe with 10 marketed products, 2 additional products that are generating revenue under procurement contracts with the government that are not licensed yet, AV7909, which is the second-generation anthrax vaccine candidate as well as our Trobigard auto-injector platform that Doug will review.

We have 15-plus products in various stages of development across all 3 product-driven business units, vaccines, therapeutics as well as devices. And as Syed will review with you here shortly, we have a molecule to market strategy for growing our CDMO business well into the future.

The numbers speak for themselves, almost a $3 billion market cap company, with over $1 billion of revenue anticipated this year and a very healthy EBITDA contribution of almost $300 million for the year. So the question, where do we go from here. My colleagues will talk about the portfolio. I'm not going to go through the individual elements other than to say that we have a good cross-representation of products in vaccines, therapeutics and devices as well as the CDMO business unit. We'll go through the pipeline in more detail, and Abbey and Doug and Laura will tell you what's exciting about them going forward. But for 2020 through 2024, our challenge again to the organization is to double revenue yet again, not surprising. We think we can easily deliver over $2 billion of revenue by the end of 2024 and deliver that in a way that is consistent with our disciplined financial metrics and have an EBITDA margin of between 27% and 30%.

We expect to continue to expand and build our leadership positions across the public health threat market and, at the same time, do so by investing in key core capabilities that will leverage what we have today, but also take advantage of opportunities in this expanding public health threat market.

We've developed and identified 5 core strategies that you'll hear from my colleagues this morning, the first of which is to execute on the core business; the second is to grow through M&A -- continue to grow through M&A.; the third is strengthen our R&D portfolio; the fourth is to build scalable capabilities to support the business going forward; and last is continue to evolve our culture of resilience, perseverance, pride and delivering on our commitments.

So let me take each one of those quickly and go through them. So the first one, execute in the core business. Again, you'll hear from us over and over this morning our thoughts on building leadership positions at scale across this growing public health threat market. You'll hear from Adam in a few minutes that we see that public health threat market in the area and size of about $30 billion. So there's ample opportunity for us to expand our reach and our leadership positions and a very large and diverse and growing public health threat market.

The second strategy is to grow through M&A. As you've seen from us, we've delivered on multiple M&A transactions over the last 2 years alone, generating that $600 million of additional revenue on an annual basis. Our focus will continue to be on growing through M&A top line revenue, but doing so in a profitable way. And Atul will come up later this morning to go through in more detail our approach to M&A, but it's going to be very similar to what we've done over the last several years.

The third strategy is strengthen the R&D portfolio. So we continue to invest carefully in at-risk R&D in order to fuel growth on top line revenue well beyond this 2020 through 2024 period. While it's nice to think that we could double revenue every 4 or 5 years only through M&A, the management team and I believe that while that M&A is attractive and possible, it will be critically important as we go forward to have robust development products in advanced stages generating revenue at the end of this 2020 through 2024 period as well beyond.

The fourth core strategy is to build scalable capabilities. As you heard from my earlier comments, we have a history of proactively investing in growth ahead of when it happens. We did that in 2005, and we've committed $75 million of capital at a time when we didn't really have that much to spend in a new state of the industry and state-of-the-art manufacturing facility. We did it 3 years ago in 2016 when we invested $20 million in a complete redo of our SAP system because we knew that in order to build scale, effectively integrate new acquisitions and assets into the enterprise, we needed to have a significantly strengthened and more durable SAP platform. We're doing it today, and you'll hear from Abbey and from Laura and Doug that as we expand and increase the channels of distribution for our portfolio that we have today and we expect going forward, and in addition to business to government channels, the business to commercial channels, we need to build scalable commercial capabilities to support that growth going forward.

And lastly, we commit to continue to evolve our culture. It's been something that's been key to our growth here to date. We started the business, again, 21 years ago and quickly developed a bit of toughness and mental perseverance that is ingrained in our employees, in our leadership team, and we seek to continue to drive engagement and empowerment of all of our employees toward our mission of protecting and enhancing life. That strategy and those core strategies, in particular, will be led by this management team that you see on the screen. So you'll hear from Adam Havey shortly; you'll hear from Sean Kirk; you'll hear from Atul Saran; and you'll hear from Rich Lindahl, our CFO.

In addition, we also have Katy Strei, our Head of HR; and Chris Frech as Head of our Government Affairs Group here today, who will be available during lunch and during Q&A and during the breakout. This 7-person management team has over 75 years of experience just with Emergent. And I joke when I say that the new entrants, Katy and Atul and Rich are kind of bringing down our batting average. If we were up to Adam and Sean and Chris and I, the average is probably closer to 18 to 20 years, but they've brought a talent and depth of understanding to their functions that is critically important and are really important members of the team.

In addition to that core executive team, we have our business unit heads here. As Bob introduced, Abbey Jenkins for the vaccine business; Laura Saward for therapeutics; Doug White for Devices; and our newest member Syed Husain for the CDMO business. So we have, back to my earlier comment, a significantly strengthened leadership team and bench strength throughout the organization that will drive this growth and execute on these strategies.

Before I hand the baton over to Adam, let me just leave you with a couple of takeaways for now. I'll remind you that we have a 21-year track record of building and maintaining leadership positions in this growing public health threat market. We think that's easily scalable and leverageable, and the capabilities and competencies that we've created in the business in our short 21-year history is significant. We are an established leader. We're a recognized leader by our partners and our peers, and we will continue to be financially disciplined in how we deploy our capital and invest in manufacturing, infrastructure, in R&D as well as in our governing and administrative processes.

There's a strong history and a strong foundation of growth that we leverage. And I'll close out by saying in my 21-year history of being with the company, we have never seen opportunities like we see today. So speaking on behalf of the management team, and I think you'll hear that level of excitement from them going forward, even for introverts like myself, there's a lot of power in this machine that we've created, and I can't wait for you to hear from Adam and the whole team.

So with that, I'm going to turn it over to Adam

Adam R. Havey, Emergent BioSolutions Inc. - Executive VP of Business Operations

Thanks, Bob. Good morning, everyone. As Bob mentioned, I'm Adam Havey, the Executive Vice President of Business Operations, and I've been with Emergent since 2003 and have had kind of a front row seat to watch some of the growth that Bob spoke to. And as he mentioned, I think one of the -- we were talking about this at breakfast just a few minutes ago with a few of you, I think one of the fun parts of preparing for this day was to get a chance -- gave us a chance to look back, and I think it's pretty amazing the business that we've built. And -- but probably the most amazing thing is, as we sit here today and as you're going to hear from each of the business leaders, we have more opportunities to really have a much, much larger impact in public health than I think we ever imagined or dreamed.

So with that, I'm thrilled to talk to you about how we're going to double revenue, grow profitably and really expand our leadership position in an emerging public health threats market. And in my section, what I'd like to do is really talk through -- sorry, I didn't advance the slide there -- really talk through a few kind of important messages. First, why the work we do at Emergent is so important. I want to highlight a few trends that we think globally give some momentum and strength to the business, provide some details on our definition around the growing public health threat space, and also kind of size that market. Bob talked about the $30 billion. I'll talk about some of the specifics and details. And then last, share some, I think, compelling reasons why Emergent is uniquely positioned to grow with new customers and new partners in this space.

So let's start by talking about why -- what we do is important, the impact of public health threats on us all. It touches, I think, our lives every day. The impact that it has on society is significant. Who hasn't been touched by the opioid crisis? This is a crisis that I think a lot of folks kind of attribute to kind of illicit drug use, but I think there's a lot of statistics out there from the CDC that say, many of the folks that have become addicted to opioids first started by getting -- or using prescription medications.

And did you know that the overall economic impact of this crisis has been greater than $500 billion? I think one of the themes you're going to hear through all of our businesses is that these are large markets that are growing. It's not uncommon today to get a Google alert or a message or read -- pick up a newspaper and read about another outbreak. Just in the last week or so, I've gotten alerts around a diagnosis of plague in China. I live in Michigan, and we've been getting these news updates or alerts around this Eastern equine encephalitis outbreak. And I think we've all seen recent news around Ebola and Ebola vaccines being approved for use in Africa.

Did you know that the most recent Zika, Ebola and SARS outbreak had a greater than $140 billion economic impact globally? Again, large markets, and we think we need to do more in those spaces.

Last, as far as kind of the front of national security and terrorism, there's consistent trends that more and more civilians are attacked each year. Did you know that the global economic impact of terrorism is greater than $50 billion? So these complex scenarios and their economic burden really fuel our mission to protect and enhance life.

So as you kind of digest maybe the scope of that impact and think about maybe personally how it's impacted you, I wanted to highlight a few trends as I mentioned before that I think you might not ordinarily link to the public health threat space. The first is climate change. I think everybody's generally aligned that temperatures are rising and things are changing. We see that as an area that it will likely lead to a faster or an increasing spread of diseases, if it's through mosquito-borne vectors or other modalities as well as an increase in natural disasters. And I think the message here is we need to be more prepared. And as a company, I think Emergent is going to provide solutions so we can be more prepared.

As travel and tourism continues to grow and expand, and you're going to hear Abbey talk about the travel health space and why we believe we can win in that arena, I think that also has the potential to spread disease. When you think about flu, not just pandemic, but on a seasonal basis, in the U.S. alone in the last 2017 to 2018 flu season, it was estimated that 80,000 deaths occurred. And I think in many of these areas, I think my message here is we need to do more. And I think we all know that with advances in biotechnology, they can drive great products and solutions like we're going to talk to you about, but there's also maybe some downsides on that, meaning, folks that are bad actors will develop new and novel bioterror agents. And this will threaten our national security. And this has been at our core, and we'll continue to drive with the U.S. government and governments abroad to make the world a safer place.

So I think before I jump into the market sizes and numbers, Emergent is dedicated to finding new solutions and better ways to contain the spread of disease and respond quickly to outbreaks or when emergencies occur. And I think all of these factors kind of reinforce this message that this market is growing, and it's something that is well suited and maybe uniquely suited to thrive in.

So here, this -- the wheels, as we've called them or the balls, the soccer ball, I think this slide is meant to show 2 things. One that we're addressing a larger portion of the public health threats market in this new plan. If you kind of look at where we started, we talk about CBRNE, but really in those days, I think we were a biodefense company, a government contractor. But there's been a kind of steady and a constancy of purpose through each of these stages, each of these years, built on that culture of resilience and toughness and delivering on our commitments. And over time, we've been able to add strategically different pieces to this ball. And the message today is the ball is growing

even a little bit larger for us. And the reasons that it is growing is we believe we can have leadership positions in public health threats as a whole or as a sum, but specifically also in each of these kind of unique spaces.

And I'm going to talk kind of in-depth with each one, and you're going to hear this theme throughout as the business units address it. I guess 2 kind of points here before going into some more specifics. First is that circle that includes CBRNE emerging infectious diseases, travel health, emerging health crises and acute and emergency care. That ball, in total, we see as a market opportunity today is $30 billion and growing. And I think as you put that in context to where we were in other growth plans, in particular, toward that 2016 time frame, that's nearly about a 3x increase in the opportunity as we saw it back then.

So let's dive a little bit deeper into each of the segments of the circle. We've, obviously, been a leader in the CBRNE space for quite some time. We're going to continue to work with the U.S. government and governments across the globe to deliver and create stockpiles and deliver biodefense solutions.

In the emerging infectious disease space, you're going to hear a constant theme of really broadening our pipeline to address new diseases and new unmet needs.

In travel health, we're going to deepen our product portfolio and move into areas like chikungunya, which Abbey is going to talk about a little bit later.

On the emerging health crises front, we're going to continue to lean in and be at the ready to respond to this current health crisis. And one of the other themes, I think, you're going to hear throughout is that, as we build these solutions, there's ways to apply these to the next crises. So kind of being ready for -- in an emergency or being ready and able to respond like we do with our CIADM are kind of key tenets that underpin the entire business.

And then in the area of acute care or emergency care, we're really going to expand. Right now, we just see this as a natural nexus to the work that we do. In all of these, we've talked in the past about the space and the idea of accidental, natural or intentional disasters. In all of those cases, there's a need to respond. And with products like our botulism antitoxin or BAT and with NARCAN nasal spray, we're kind of already acting in this space and working in this space.

So before I go into each of the business units in a little bit more detail and put some numbers to these markets, so you can kind of add it up and make sense of it, I know many of you that have followed the story -- I just want to kind of set the stage. Many of you that have followed the story back in 2016, we outlined this plan to grow the business, and there's a number of strategies, but I think one of the ones that applies here the most is we're really focused on opportunities that were dual-market. And dual-market meant this kind of unique combination of commercial and government. And I think with the addition of NARCAN nasal spray and the travel vaccines, I think you can see we've demonstrated that or we've been able to do that. So as you look at this ball and as you think about the market opportunity in total, we're going to continue to kind of thrive in that leadership government space, but we plan to deliberately find additional niche commercial markets that have a close nexus to what we do, again, building on our core competencies and those strengths. And our aim here with the sum of all of this is to become the go-to company when it comes to emergency response, public health and readiness. And we want NGOs and governments across the globe as well as the public to think of Emergent first when these things happen. So on the pages that follow, I'll really try to relate these opportunities to each of the business units and try to lay out a summary of our game plan to grow the business profitably.

So let's jump into the business units. Let me set the stage here. Each of our businesses have a biodefense component to it, so you're going to see this kind of gray box on the left here. And I just want to kind of frame that a bit. So each business unit addresses that global biodefense market, which we believe to be about $10 billion today and growing. In addition, they address other markets that may or may not be included as an element of biodefense. And in the case of vaccines, Abbey's team is trying to drive into this travel health market, which we believe to be about $3 billion and growing.

So as Abbey will talk more about the specifics of that and why we think we can be a leader there, I'm going to talk to you just at a high level about kind of what their growth formula is. And it's pretty simple and straightforward. They want to advance our smallpox and anthrax franchise globally on the medical countermeasures front. They want to build scale by adding new products to our travel health portfolio, both marketed products and markets as well as new products in development. And we're going to be very strategic and selective on the M&A front to be able to push into that public health threat or that expanded public health threat market.

So let's talk about therapeutics. I think this is a great example of where combining biodefense and acute care can be very compelling. We're going to build on our core capabilities in the plasma space and the monoclonal antibody space, both drug development and manufacturing, and again continue to leverage that leadership position in medical countermeasures. We see this addressable market or the therapeutics market, specifically what we can address as being approximately an $8 billion opportunity. And as Laura will talk to you a little bit later, I think you're going to see an ability within this business to kind of customize solutions and, in particular, we're going to unveil and talk about a

rapid response technology that we think ties right into those statements I made earlier, Emergent being an innovator and a company that could be a go-to organization in the time of need.

So the therapeutics team's formula for growth is similar and, I think, consistent to vaccines in some ways. They're going to advance that MCM leadership position across the globe, specifically in smallpox and botulism. They're going to develop new products on proven -- on a proven technology base. And the example here you're going to hear from Laura is on our flu immune globulin product, a rescue therapy that will hit in that acute care or emergency care space.

We're going to, again, be selective on the M&A front of what fits and what doesn't fit with our core competencies. And one thing that will be unique to Laura is she's going to look to partner and her team is going to look to partner with new NGOs to continue to push the envelope on innovation when it comes to developing novel rapid response technology.

So when we talk about public health threats and devices, I really think combining biodefense and devices is compelling and influential. The devices strategy is one that in a market that we defined was a $14 billion addressable market, and let me break that down, Doug will go into a little bit more detail later, but it's really kind of 3 primary areas. That $14 billion opportunity includes opioids and opioid use disorder; it includes chemical medical countermeasures. Back to the beginning, we talked about being in that CBRNE space. I think we're always a leader in B and maybe a fast follower in C. And I think over the years, we've kind of started to emerge as a leader in C. And at the end of this plan, you're going to hear Doug's team talk about being a leader in the chemical medical space, for sure.

It also includes kind of acute care, specialty care as well as this concept of threat detection and diagnostics. So we're looking for adjacencies. In many of these situations, for example, in Zika, we've had to develop novel ways to track and monitor or detect that. And there could be some commercial applications or overlap between the businesses, and Doug's team is evaluating that.

I think in devices, in total, we're going to continue to build on that leadership position in NARCAN nasal spray. And over the next 5 years, really deliver novel drug device combos in the areas of military auto injectors, cyanide poisoning and pain management. So Doug will go into detail. I know most of the questions lately on the calls have been NARCAN-related. So we'll talk through all of the specifics of NARCAN, the market and where that's going. But we're also going to focus on this broader, I'll say, device formula for growth.

So we're going to leverage our government contracting expertise at both the state and federal levels. You've seen some recent contract awards in this space, and I think we're going to continue to have wins in this area. We're going to build out a novel portfolio of auto-injector solutions that will work in military settings, and I think we'll have some adjacencies on the commercial side. And we're going to continue to stand at the ready to improve access, affordability and availability of NARCAN nasal spray and address this immediate health crisis.

So in summary, before we kind of switch to the services piece of the equation, I just want to add up some of the numbers and try to make it all stick together. So if you go back to the vaccines business, you've got a $3 billion kind of addressable market in the travel health space. In the therapeutics arena, we've got an $8 billion addressable market based on what we see to be our core competencies and capabilities. And in the Devices space, it's about a $14 billion opportunity. So if you kind of add those together, it's about a $25 billion opportunity. And then I mentioned upfront that all of the businesses touch that global biodefense market, but there is some overlap between those addressable markets and biodefense. So that's how we get to the 30 -- greater than $30 billion. So it's somewhere north of $30 billion. And in all of these cases, uniquely, these markets are growing as a total, and there's -- as Bob mentioned, there's ample room for us to push in and grow in all of these spaces.

So let's flip over to the services side of the house and talk specifically about contract development and manufacturing. You're going to hear all of us probably say 21-year track record multiple times, and it's probably something we're most proud of or I'm most proud of. We've developed kind of unique quality in manufacturing systems not just to meet cGMP, but to be innovative and have created, I think, a whole host of capabilities. And the reason they're unique is that we work with some of the most dangerous biological agents in the world. If it's live viruses, if it's blood plasma products or anthrax, you need specific capabilities and strengths that most organizations don't have. It also speaks to the depth that we have, both on the quality and the manufacturing side.

And so given what we do and who our customers are, I think it's been critical, it's been of strategic importance that we develop and own our own sites from a manufacturing perspective. And it's important for lots of reasons, but probably most importantly because we need to be able to flex. When these emergencies occur, we have to flex; and when priorities change from a national security perspective, we need to be able to flex. And owning and controlling those manufacturing facilities, I think, is a key component of who we are and what we do. So I think with both of those, the history, the uniqueness, I think that means that we've got this skill set that not a lot of folks have. And Sean and Syed are going to talk about this $20 billion global opportunity and how we're going to be very measured, selective and disciplined in how we move into this space.

So I'm not going to go through specifics in their growth formula, they're going to talk about it. But nonetheless, we've got an amazing team of people that are kind of working tirelessly to support both internal and external customers on a

daily basis.

So I framed out the markets. The other thing that's kind of moved in parallel, I think, with the markets has been our customer base. Here -- and you saw it in Bob's history, I think, in 1998, we were a 1 product, 1 location, 1 customer organization. And through the first probably decade, we -- I think we grew that incrementally. Maybe we had 2, 3, maybe 4 customers. But as you can see on the right here, today, we've got a pretty diverse group of partners and customers that we work with. And I think many of you when you either saw the invitation for the Investor Day or maybe when you were walking over here this morning, you can maybe had in your mind that we're going to hear from Emergent, the government contractor. And you really probably thought about this orange slice of the pie or the column. And I think one of the messages I want you to take home today is, we're definitely that, and we've got that at our core, but we've grown so much further past that.

Coming here today, did you think that Emergent worked with Walmart, CVS, Costco, Rite Aid, Walgreens and Passport Health? I'm not sure everybody really appreciates maybe the depth that we have in the organization.

Do you know that we're working kind of actively in partnership with many NGOs, like CEPI and SAVE in Global Good and the Gates Foundation. And on the customer side, externally, we work with over 50 small, mid and large-sized biotech organizations.

So in closing, I've never been more opportunistic about the growth of this business. I think it's different than at any time I've been in Emergent. When I joined -- I joined the company because I wanted to be part of a company that was mission-driven, that was going to make a difference in the military and in the U.S., and now I'm kind of honored to be part of a company that I think is going to have a significant impact in public health across the globe.

And so as I close, there's a couple of key takeaways and, most importantly, I just -- I think Emergent is uniquely positioned to operate in these large and expanding global public health threat markets. And we're going to continue to build on our leadership position and emergency response, travel health and national security. We're going to leverage those unique assets to solve really complex and unaddressed public health threats.

Bob mentioned the culture. I think one of the things that's very interesting and I think motivating dynamic about Emergent is that we kind of do hard things because we like them. I think many of these problems are very challenging. The overall impact that these things have on society are significant. And we run at these things. Being at the ready or responding to emergencies is an easy work, and we're proud to do it. We've got over 1,800 folks that do this every single day kind of relentlessly. And it's special to be part of this. We've talked about the management team. We've talked about our excitement around the growing market. And so what I'm going to do is turn it over to Abbey, and she's going to talk to you about the vaccines business unit. But I think the -- maybe the last closing point that I wanted to make is, I think all of these together allow Emergent to provide, in a way, to governments, to the public, to patients, to customers a sense of security in a very uncertain world.

So thanks for the time. I'm going to turn it over to Abbey, and she's going to talk to you about the vaccines business.

Abigail L. Jenkins, Emergent BioSolutions Inc. - SVP of Vaccines Business Unit Head

Good morning. I'm Abbey Jenkins, and I head up the vaccines business unit. And I too, just like Bob, am super excited to be here this morning and share our 5-year strategy with you.

I've been with Emergent for 18 months, but little known fact is that I actually started my career out of college, working with the Department of Defense on their investigational vaccine portfolio, which included the anthrax vaccine. From there, I spent 20 years in the industry, working at big companies like Pfizer and AstraZeneca and small companies that were just trying to bring their first product to market. In that time, I've specialized in the commercialization and launch of products in many different therapeutic areas, but my heart belongs to infectious diseases. That's where I started. And I've had the opportunity to work on antibiotics, vaccines and monoclonal antibodies in this space. And it was one of the key reasons why I decided to return to my origins, return to vaccines and come to Emergent to be a part of this important transformation.

I'm excited to share with you our 5-year strategy and share the fact that we've evolved well beyond where we started with the anthrax vaccine.

Our vision really centers on that heart and heritage of Emergent. It's where everything began with the BioThrax vaccine for anthrax. When we think about our vision for this business unit, it's not only a critical part of the history of Emergent, but it's essential to our long-term growth strategy.

Our vision really centers on building on our leadership position in the medical countermeasures of Biodefense space, protecting soldiers and military personnel as well as civilians from biological threats with our medical countermeasure vaccines and expanding into this new world, emerging as the leader in travel health vaccines, delivering and developing these -- developing and delivering these medications to protect and prepare travelers to enhance their journeys as they travel globally around the world.

When we think about our 5-year strategy, it really centers on 3 things. The first is that we intend to shape the market through our science. An important part of our future is going to be generating -- supporting the generation of epidemiological and burden of disease data that helps to raise awareness for these important biological threats in the marketplace. We want to use that science to help develop and deliver innovative vaccines like our chikungunya vaccine, which will meet critical unmet needs in the market today.

And finally, we want to operate in a very customer-centric way. Our business, as you've heard from Bob and Adam, has fundamentally diversified beyond a single customer and beyond just a government business to a new world with commercial customers in the travel health space. We want to make sure that we're factoring these needs as we develop and deliver these medications into the market.

During the course of my presentation today, I'm really going to organize the information into these 2 categories. The medical countermeasure of biodefense vaccine side and then our travel health commercial portfolio.

Let's start with that. Let's talk about our products, first and foremost. We now have a robust portfolio of vaccine products. They fall into these 2 categories of medical countermeasure and travel health vaccines. Not only do we remain the leaders in anthrax vaccines with our BioThrax vaccine, which has important differentiated indications for both pre and post exposure prophylaxis from anthrax, but we've recently introduced our next-generation product candidate, AV7909, into the strategic national stockpile, and it too offers unique and differentiated benefits. This product is different and better suited for the unique attributes of a faster onset of action and a reduced dosing schedule, and it was developed in conjunction with the U.S. government for this purpose.

In addition to these 2 medical countermeasure vaccines, we also have ACAM2000, which is the cornerstone strategy of the U.S. government's preparedness against smallpox.

Turning now to our recently acquired travel health vaccines. These too offer differentiated benefits in the market. We have Vaxchora, which is the only FDA-approved and oral vaccine for cholera in the U.S. And we have Vivotif, which has a 35-year history of offering protection against typhoid and is also an oral vaccine. I'm excited -- I'll be excited to share more information about this as we go forward with the travel health vaccine portfolio.

But now let's turn to our R&D pipeline. You heard from Bob earlier that a critical element of our growth strategy centers around our investment in R&D. You can see that in the vaccines business unit, we are no exception. We have over 8 development programs, spanning from early preclinical programs in the emerging infectious disease space all the way up through life cycle management. It's important that we invest not only in developing and delivering these innovative vaccines, but we fully invest in recognizing the maximum value, looking at new indications, expanding into new markets and, ultimately, making sure that we're providing a maximal benefit to protect patients from these biological threats.

So now you've heard a little bit about our products. You've heard a bit about our portfolio. Let's jump into the business. I think a great starting point, and we're going to start with the medical countermeasure side of the business, is just understanding how we view this business from a global opportunity. When we say global, we mean global sort of. We mean select international markets as well as building on the strong foundation of business we have in the U.S. In fact, we have this 21-year history partnering with the U.S. government on the development and delivery of these medical countermeasure vaccines. And as of 2019, 90% -- 98% of our revenue from the medical countermeasure vaccines remains from that U.S. government partnership. However, when we look at the world internationally, we want to look for other governments that have those similar aligned goals around protecting and preparing against biological threats in the marketplace. You can see on the slide a few examples of other governments that have that similar shared interest to that of the U.S. government.

When we think about the products that we have in this space, and this is going to be a key takeaway for the rest of the presentation, what you need to know about our medical countermeasure vaccines portfolio is this not only represents the 20-year history of the company, but this remains an opportunity for strong and stable growth. That's small growth on a very large base, and that trend is going to continue. I think the numbers on this slide speak for themselves. We've had tremendous success over the 20-year history, culminating a multimillion dollar and multiyear contracts across our portfolio.

We achieved an exciting milestone in 2019. We expanded from having 1 anthrax vaccine to having 2 anthrax vaccines that best meet the needs of the government. We have a 5-year existing contract with BioThrax and BioThrax isn't going anywhere. BioThrax is really well suited with its pre-exposure prophylaxis indication to protect military personnel against these biological threats when they are deployed in overseas missions.

We've also recently introduced our next-generation anthrax product candidate, not yet approved -- anthrax candidate into the strategic national stockpile. We secured 2 contracts totaling 13 million doses and we began fulfilling on this contract in August of this year.

Additionally, we secured the largest contract in the company's history with ACAM2000. A 10-year, $2 billion contract for ACAM. This contract offered improved pricing and improved margins over the previous 10-year contract, and we

began fulfilling on that first 18 million dose option just a few months ago.

This is tremendous. This shows not only the power that Emergent has had in this medical countermeasure space, but demonstrates the strong foundation we are heading into 2020 with. I'm very excited about these vaccines. When we think about why the U.S. government is continuing to be interested in this medical countermeasure space with biological threats, well, fundamentally, anthrax and smallpox remain 2 of the top threats that the U.S. government wants to protect the population, both military and civilian, against -- civilians, against. These 2 vaccines, AV7909 and ACAM, offer the type of benefits the government is looking for, which is the reason why they remain the cornerstone of their preparedness strategy against these biological threats.

When we think again about this opportunity more broadly, we know the U.S. government is going to be a critical partner as we move forward. But we also know that there are select opportunities internationally where governments have these similar goals around protecting and preparing against these specific threats, which are active, as Adam said earlier, every day in the market overseas.

So again, the takeaway here for the medical countermeasure side of the business is that this is a very strong and stable base, and we expect to have small growth on this large base for the next 5 to 10 years moving forward.

Let's shift gears now into travel health. Travel health, lets start in the same place that we started with our medical countermeasures vaccines. Let's think about how we think about this opportunity globally. Let's think about that global market opportunity, which data suggests is $3 billion today, as I've shared with you, but growing to $5 billion over the next 5 years. This growth, just like with our medical countermeasures business, seems to be driven largely by European, U.S. and Canadian travelers traveling to these endemic areas. In fact, 75% of the revenue tied to travel health vaccines is tied to these key markets.

When we look at our own travel health vaccine portfolio, similar to the medical countermeasures side, we also see that 80% of the revenue that we derive from travel health vaccines is, in fact, coming right from just U.S. travelers alone. So this will continue to be a key focus for us moving forward.

Now you may have come into this presentation hearing about travel health vaccines that Emergent has recently acquired and an interest in the space, but you might be wondering to yourself, why? Why does Emergent think that travel health vaccines really offer the type of specialty opportunity we should be investing our dollars in? Let me tell you why. There are 4 key reasons. The first, as I've already shared, is the fact that this is a growing market. As the population grows, there is a growing number of travelers, and these travelers are getting more and more ambitious in the destinations they travel to. So it's a growing market.

The second reason is the fact that when we make an investment in this area, it's a very long-term investment. You all are in the investment community, so you know that if you make an investment today and it pays off for 20 or 30 years, that's a great investment in a growing market. Well, that's what a travel health vaccine represents. Our Vivotif typhoid vaccine is a great example of this. This is a product that's 35 years on the market and growing. These are the types of smart investments that we believe are possible here at Emergent.

The third reason is the fact that this is a relatively free market. There are 2 key decisions -- 2 key decision makers and the decision-making process to purchase this vaccine. Health care providers who decide to purchase the product and administer it in their offices and travelers who ultimately often make the decision to pay out-of-pocket for these travel vaccines. That offers us a unique and targeted universe for the uptake of these products.

And finally, that unique and targeted universe extends to our customers as well. The targeted universe of health care providers who specialize in travel health and a targeted group of customers that we found from a traveler perspective, we're able to connect, engage and empower through digital marketing to drive them into the office. That's an exciting opportunity. And we aspire to be, as I mentioned earlier, leaders in this space and we believe that we have the potential to capitalize on all of these factors to emerge as the leader in travel health vaccines moving forward.

Now I'm going to shift into a bit of education and start with the fact that not all travel health vaccines -- well, very exciting, I hope you're very excited for what's coming -- not all travel vaccines are the same. And there are 3 important dimensions that you must consider in assessing the market potential of any individual travel health vaccine in this market.

Let's start with the first dimension. That first dimension is around figuring out the market opportunity within a particular vaccine. When we think about cholera and we look just at U.S. travelers, again as a key and critical market, and we think about the market opportunity for travelers going to cholera endemic areas, we project that there are about 3 million U.S. travelers traveling to cholera endemic areas. We compare that to typhoid, double the amount of travelers that are traveling to typhoid endemic areas, and this has to do with the epidemiology and the prevalence of these 2 diseases.

When we compare cholera and typhoid to something like our newest product candidate, chikungunya, it's a totally different story. We project there are over 30 million -- 35 million travelers that are traveling to chikungunya endemic

areas. So again, when you think about these travel health vaccines, this first dimension in assessing the size of the market is the first critical step in doing that.

Let's move on to the second dimension. That's around the disease characteristics. It's important to understand these disease characteristics because they inform how physicians and travelers consider the need for a vaccine to prevent against these infectious diseases. The first element is the mode of transition -- transmission. Often travelers and health care providers overestimate their ability to protect from food and waterborne illnesses. They may not appreciate today the need for these vaccines as much as they should. The second is around the burden of disease. So how sick you get if you encounter something like cholera, chikungunya, typhoid? Doctors and health care -- and other health care providers as well as patients consider that, is this a short-term illness? Is this a severe and acute illness? Are there any long-term chronic sequelae of the disease? These are additional factors. And finally, whether or not there's a recommendation for use? And there are 3 categories of recommendations. A recommendation to consider vaccination; a recommendation for vaccination; and a recommendation for a required vaccine to enter a particular country. So all of these factors, again, come together to inform the disease characteristics that inform the market and uptake.

Finally, the third dimension is around the vaccine attributes itself. So how does the particular vaccine compete in the market? Is it the only vaccine? Is it 1 of 2 or 3 vaccines in the market? And what are those unique attributes that are going to drive growth from a vaccine specific perspective?

From our vaccines, looking just at Vaxchora and Vivotif now, we know that there are some exciting attributes about -- and differentiated attributes about each of these vaccines. First with Vaxchora. It is the only FDA-approved vaccine for cholera in the U.S. and it's an oral vaccine. Our market research shows that over 50% of travelers prefer an oral vaccine when given the option. Second, Vaxchora also has been recently approved for refrigerated use. I mentioned that it's not only important for us to develop and deliver these vaccines, but to fully life cycle manage the product. Vaxchora is a great example where we had a frozen vaccine, we've now moved to a refrigerated vaccine, and we're investing in not only delivering this product in the U.S. market, we'll be launching into Europe with approval next year expected.

When we think about Vivotif, Vivotif also has differentiated benefits. It too is an oral vaccine, and it's 1 of 2 options in the market. So there's limited competition, again, supporting that long-term sustainable type of model for investment. And just like Vaxchora, which I failed to highlight, has this big growth or has big growth on the small base where we can see with Vaxchora, it's 35% growth year-over-year. Even though Vivotif has been on the market for 35 years, we're still seeing growth in the market. In fact, 12% year-over-year growth driven by that growth in travelers.

Additionally, we found that we were able to establish 40% market share compared to the incumbent vaccine competitor. This shows that when you launch into an established market, you've got a great opportunity to demonstrate the differentiated benefits of your particular vaccine. We've also seen with Vivotif that there's a real opportunity in alternate channels like pharmacy where we have 60% of our volume for Vivotif going through the travel market within the pharmacy channel. This is pretty exciting, right?

I think you're seeing why travel health is a really great and exciting opportunity for Emergent to be in. I'm sure you've all been waiting for the moment. We've teased you a lot around chikungunya, right? So I'm sure you're excited to hear why -- how these 3 attributes stack up for our chikungunya vaccine? Well, I'm going to make you wait 1 more minute because I want to tell you how excited I am. You heard that Bob is excited. You heard that Adam is excited. But I'm here to tell you, I am the most excited person about the chikungunya vaccine at Emergent. And the reason why I'm so excited is because I've been developing and launching products in this industry for over 20 years, and I've never seen a product like this. I've never seen a product that has the potential to offer this -- these benefits -- this many benefits on all 3 dimensions of a vaccine candidate.

So let me jump into it and share those with you now. You already saw the first dimension, which is the large market opportunity. Let me build on that with the second dimension around the disease characteristics. So chikungunya is the type of disease that provides the greatest sort of biological threat out in the marketplace. It's a mosquito-borne illness. And when you get chikungunya, which might be something you hadn't even heard of before you started following Emergent or came to this meeting. When you think about chikungunya, it presents as an acute febrile illness and has the potential to develop into long-term sequelae with arthralgia and arthritis. So this is not only an acute biological threat that health care providers want to protect their population from, but it also can be a chronic threat that requires protection and prevention. When we think about the marketplace today, there are no preventions or treatments available. So this not only represents a significant burden of disease, but a tremendous unmet need in the market.

Let's move now into those second and third dimensions. Let's talk about the attributes of the product. Let's think about how this offers a highly differentiated potential benefit in the market today. So first and foremost, we are developing this product with an intent to have an indication from the beginning in adolescent patients up through adults. We expect, through the life cycle management of this product, that we will have full indications down to early pediatrics and through elderly. So we are developing this product from this minute with that in mind.

When we get into the specific attributes of the vaccine, we believe that these 5 benefits will be meaningfully differentiating in the marketplace. The reason why I said that I've never been this excited about a product candidate, much less a vaccine, is because I've never had a product that hit on all 5 meaningful attributes.

Now again, let me caution you forward-looking statements. This is a product in development. There is a lot -- there are a lot of hurdles we're going to have to cross, completing our development plan, working through the regulatory process, ultimately getting a final label approved. But if all goes as we hope, we believe that we can hit on 5 out of 5 meaningful attributes.

First, the Holy Grail, a single dose vaccine. Not only a single dose vaccine, but a single dose vaccine that has the potential to have a rapid onset of protection. The data I'll share with you in just a moment demonstrates within 1 week a traveler can have protection after getting this vaccine be fully protected.

The second is around the -- or the third is around having a broad patient population. With the design of this vaccine, with the VLP design, not a live vaccine, it has the potential to be used in that broad range of patients, young, old and potentially immunocompromised patients. We also have found that it has a well-tolerated safety profile and, and this is really exciting and I'll share more in just a moment, a durable protection benefit. Not only does this product offer these 5 out of 5 meaningful attributes from a target product profile perspective, but when we look at the type of investment we would need to make as a company to bring this product to market, it's exactly the type of thing we're looking for.

This product has the potential to have an accelerated approval pathway. It has the potential to have a correlate of protection, end point development process rather than a randomized control clinical trial, which makes a very rational investment for us to make. And obviously, for the first product that gets there, it's also PRV eligible, which is a onetime financial opportunity for the company that makes it.

When we package all of this up into a product -- into our product profile, we're offering a single dose vaccine in a prefilled syringe refrigerated from the get-go. We put all of this together, you can see how this product offers tremendous potential for Emergent and tremendous potential to offer a meaningful benefit to patients who are at risk of this disease globally.

You've heard from Emergent and our competitors around what we project the total market opportunity for chikungunya -- for the chikungunya vaccine market to be, $300 million to $500 million globally. So this shows, when you think about the chikungunya vaccine, it's hitting on all 3 of these attributes, from the market potential to the burden and risk of disease and the need for a vaccine to the benefits that a particular vaccine can provide in the market from a differentiated perspective.

We're very excited about chikungunya.

I teased you that you're going to get a little bit more data. I'm excited to share some information that is truly hot off the presses. It is being presented today at the American Society of Tropical Medicine and Hygiene, and I'm sharing not only the data you've seen before, which shows that a single dose of vaccine can provide 98% seroconversion in just 1 week after administration, but the new data that we haven't shared before until this day, which demonstrates that, that benefit can be durable 12 months after that initial single dose. That's pretty amazing. We're going to keep following these patients for another year, and we hope to see that there's an additional duration of durable protection. But from where we're sitting today, this is already a highly exciting profile for the product.

I've shared with you that we've had tremendous clinical momentum to this point. Well, I'm also excited to share that we've had tremendous regulatory momentum, again, the gifts keep coming. When we think about the opportunity for an accelerated approval pathway, this product has both Fast Track designation in the U.S. and PRIME designation in the EU. We're on the heels of a recent VRBPAC meeting, which was a public advisory committee, which we believe demonstrated that the agency understands the challenges and infeasibility of a randomized controlled clinical trial for chikungunya and demonstrated that a surrogate end point may be possible in clinical development.

Our next step is to move into conversations directly with our U.S. and European agencies to get specific feedback on our Emergent CHIKV VLP program through our next meetings in preparation to introduce a Phase III clinical trial in 2020.

Now I think you see why we are all very excited about the chikungunya, the VLP development program here at Emergent. You may be -- you've heard me say that we're going to emerge as leaders in the travel health vaccine space, which you may be wondering, well, what exactly are you going to invest in? Well, I'd like to build on the heels of what Bob said, which is, this is a great area, not only because it's a growing market, but because it offers a reasonable, scalable opportunity for us.

It offers both a unique and targeted opportunity to a select group of customers. When we make this investment, we're going to prioritize that to health care provider education and awareness. We know today that many folks in the public as well as health care providers may not fully appreciate the risks of these biological threats and the need for vaccination. It's going to be incumbent upon Emergent to be leaders in generating the science that will help to shape

and educate the market as well as hopefully support the guidelines, which will come out to better recommend and even perhaps require use of these vaccines moving forward.

Second, we're going to have a targeted opportunity to connect, engage and empower travelers. We've done market research, which allows us to understand the exact segments of the travel market that will be most receptive to messages around travel vaccine. And we've demonstrated an ability to drive these travelers into the health care provider setting, but we know that's not enough because the number one factor that influences whether a traveler gets a travel health vaccine is whether or not the physician recommends its use.

Finally, as I mentioned earlier, we're going to expand into other channels, like the pharmacy channel, where we believe that we can more meaningfully make investments that will have both cost-effective and efficient return on investment. I think you can see why travel health offers us a tremendous opportunity to not only become leaders in travel health vaccines, but to grow this business, very large growth from a small base today. In fact, we believe that the vaccines business unit has the potential to be a $1 billion franchise, all on its own, in the next 5 to 10 years, and we believe that travel health could be 50% of that revenue moving forward. That's exciting.

So with that, I'm going to leave you with a few key takeaways. The first is that medical countermeasure vaccines represent both the history and the heritage and an important part of our future moving forward. They will represent significant profit and revenue drivers for the next 5-year period.

This business, the medical countermeasures vaccines, is about small growth on a large base. Travel health is just the opposite. It's all about big growth on a small base. If we do things right -- when we do things right, we expect that this business can be an equal contributor, generating half of the revenue -- $0.5 billion of revenue over the next 5 to 10 years.

And finally, we intend to develop and deliver innovative product candidates to make meaningful benefits in the marketplace like our chikungunya vaccine. We believe that chikungunya has the potential to offer 5 out of 5 meaningfully differentiated attributes to health care providers and provide a meaningful benefit to this important public health space.

Finally, I'm standing on this stage able to say something I've never said in 20 years, even working at bigger companies. We have the potential just within the vaccines business unit to launch a new indication, launch into a new market, or launch a fully new product every year for the next 5 years. And in some years, we will do all of those things in a single year. I think you can see why our travel health and medical countermeasure vaccine portfolio offers a tremendous growth opportunity, not only to this business unit, to Emergent at large.

With that, I'll turn it over to Laura Saward, who is going to build on this infectious disease story with our therapeutics business unit strategy. Laura?

Laura Saward, Emergent BioSolutions Canada Inc. - Chief Scientific Officer

Thanks, Abbey. Maybe as I dive into giving you an overview of our exciting growth strategy for the therapeutics business, I'll just take a moment to introduce myself for those who don't know me.

So I've been with the company, Emergent, for 15 years in total. I actually came through the Cangene acquisition to Emergent to join the team there. At that time, I was the Chief Scientific Officer for Cangene. And in my career, I've had more than 25 years experience in a number of different areas of the pharma business. Similar to Abbey, I've worked in big and small pharma. And really, one of my passions is the infectious disease area. So currently, I still -- I hold an adjunct professorship in medical microbiology and infectious disease, which allows me to stay close to the infectious disease community and some of the trends that are happening there.

So then looking at our business unit and focusing on therapeutics now. I think this is a really key pillar for Emergent. So Adam pointed out, and our expanded scope around public health threats, that there is a number of public health threats that we're looking to impact in the future. And when we think of therapeutics, they're really the ability to intervene when you've either already got the disease or you've been exposed to the disease. So they're critical to our mission to protect and enhance life because we can't always be in front of the disease from a vaccine perspective.

So when I look at the foundation for this business unit, we really are building off a strong leadership position already as a recognized leader in therapeutics for public health threats. So we have a strong portfolio of approved products as well as a broad pipeline. And what we're looking to do in our vision of growing this business unit is really build off this leadership position, wanting to take on a broader scope of public health threats as well as build some capabilities around our rapid response and solution provider.

We will be expecting to grow them as we look at achieving this vision beyond just antibody therapeutics in the future. And so when we're looking at how we'll achieve our 5-year growth strategy and achieve this vision, it's really important to think how we'll grow and scale the business, and there are some very specific strategies that we're going to be focused on. So one of these strategies is looking at how we will build our commercial capabilities for the

business unit, and we will be moving into these more commercial spaces, Adam highlighted some of the areas around acute care that fit very nicely with our public health threat focus, and this will be our commercial growth driver for this business unit.

We'll continue to strengthen our pipeline, focusing on both our organic pipeline, so the investments that we're making internally, but also keeping a strong focus on our external partnerships that help to supplement that pipeline. And then a key part of this business unit, and I'll certainly go into this more when we look at our marketed portfolio as well as our pipeline, is we'll look to leverage our proven technologies. We have a number of platforms that really are the strong foundation for this business unit, and we're also investing in some innovative solutions that I think will really expand the impact that we can have in the future.

So here is a snapshot of what we look like today. Our portfolio of products that we currently have approved really reflect a number of life-threatening diseases and threats going across some of our core areas of portfolio for the company looking at therapeutics to address smallpox preparedness, anthrax as well as the botulism poisoning.

So first, our VIGIV product is the only FDA product that's been licensed for treating the complications from smallpox vaccination, specifically for live viral vaccines. So it's a really key part of the smallpox preparedness portfolio. This product is approved in both U.S. and Canada, and we have a number of partnerships across the world with different governments to ensure that there's access to this life-saving medicine.

Botulism Antitoxin is one of our key products as well. So botulism is a category A threat. So this is a very potent toxin, but also it is one that has an endemic outbreaks. We'll often hear of botulism poisoning outbreaks that occur both at home as well as around the world. And botulism -- the BAT antitoxin is the only FDA licensed product that covers all 7 serotypes of botulism poisoning and can be a key life-saving therapy for this paralyzing disease.

So as we looked at how to make this available globally as a quality medicine to treat this unmet need, we have looked to license more broadly. So U.S. and Canada. More recently, we've been expanding the licensure of BAT into Singapore and Ukraine as well.

So our anthrax portfolio. We actually have 2 products that address the anthrax preparedness. So Anthrasil is the only FDA licensed polyclonal antibody treatment for inhalational anthrax. This is a key part of our hyperimmune platforms and provides the opportunity to treat once you've been infected with anthrax. The raxibacumab is a complement to this on our anthrax portfolio, is the only fully human monoclonal antibody that's been licensed by the FDA, both for the prophylaxis as well as the treatment of inhalational anthrax.

So this portfolio really provides us some broad differentiated products that we have in our current marketed portfolio, covers across our main pillars for the company for health threats. And I think it gives us some strong platforms that we'll leverage as we look at how we'll grow in the future.

When I talk about our growth strategy, we're really building off a strong foundation that I show here. And I wanted to just take a minute to talk through how I see the foundation for the growth of this business unit.

Looking at this leadership position that we have in therapeutics, I think we have an excellent track record of success. These foundational platforms that I'll talk to have really been involved in the licensure of multiple products, 4 of which I highlighted on our portfolio side. As well, we've been able to build a robust pipeline around these products and have a good track record of bringing these forward.

I think another key piece that we think about when we think of our ability to execute on our strategies is really our ability to form these well-established partnerships, long-term partnerships. Certainly, with the U.S. government, one of our key partnerships, we have a reliable and long-term partnership as a supplier to them with more than 20 years that we've been executing on both our development and our procurement contracts with the government. But really, the partnership piece goes much broader than that. We partner with a number of governments that give us the ability to really understand that need, make long-term commitments and build a sustainable business through partnership with those governments.

There's many examples where we partner with regulatory agencies throughout many of our programs that really allow us to build a sustainable and development pathway that will help us bring new products to market, and definitely continuing to partner with the scientific leaders in our fields. And I think this is really critical because, as Adam referenced, we are really tackling some of these very complicated challenges in infectious disease. And these partnerships provide us the ability to have a sustainable competitive advantage with that.

On the capabilities that we build on, looking at this business unit, we really have some deep technical expertise in Biologics. We've done a lot of different programs over the years, bringing many of these to market. This gives us that opportunity to apply the knowledge as well as the partnerships that we've developed as part of these programs. So just to give an example of this, we have some very unique experience within the business unit through the licensure of some of our programs using the Animal Rule, which in the public health threat field is a very specialized body and knowledge of how to license products when there's not a clear clinical pathway.

We also, as I mentioned, have some proven technologies. So we have our platforms on the hyperimmunes, which we've recently expanded to monoclonal antibodies. And what we have done is sort of take the knowledge from the multiple licensures on these pathways and apply it to new pathways so that we can help to shorten the development time as well as de-risk these new programs. A good example of this is recently with our Zika immunoglobulin as well as our flu immunoglobulin, we're able to very quickly get to the clinical phase of development. So I believe, as I look into this growth strategy, that this is really the foundation that we'll build on, is the sustainable competitive advantages that will help drive our growth into the future.

So here's our development pipeline as a snapshot, and certainly isn't comprehensive, but there are a few products that I really wanted to highlight because it shows the growing breadth of our focus on public health threats, and it also is a great way to highlight how we're leveraging our platforms throughout our pipeline. So the Flu-IG is our lead clinical candidate, and I'll certainly talk more to this one because this is what I'm most excited about in terms of our growth strategy and that we are just completing our Phase II study in this and will be looking to start a Phase III study in the short term. And this is a really critical therapeutic because there is a large unmet need in seasonal influenza. And I'll certainly talk more to that to explain why I think that there is a high health care burden that we can help to address with this product. I also think it's a great example of how we leverage our platform. So this is on our human hyperimmune platform similar to our VIG and our anthrax or Anthrasil immunoglobulin. So leveraging that platform to really help to advance this program quickly and de-risk it.

The Zika immunoglobulin is another public health threat. This was really an example of us taking a platform approach to go fast in response to an emerging infectious disease. So Zika has a profound impact on the developing fetus. And this was an emerging infection that came through the vector-borne mosquito disease, started to see both through travelers as well as through the North America exposure to this mosquito. You started to see this infectious disease hit home. And one of the broad issues around Zika was it was in more than 90 countries at once, which makes it very hard to contain.

So working with our platforms and our partnerships, we are able to very quickly advance a therapeutic really leveraging our safety profile in some of these target populations like the pregnant population, and we are able to show safety in the clinic. What we've done in partnerships here is really work with a number of experts in the field, and we still have, through these partnerships, a number of studies going on in order to prove efficacy of this therapeutic. And the idea here is to really show the power of the platform to respond quickly to these emerging infectious disease and to be in a state of clinical readiness if this disease reemerges and have the right data and partnerships to support going forward.

Another exciting opportunity for us is on the diphtheria antitoxin, which is the one we think a lot of in the North American context. But from a global perspective, this does have a high impact on the world. Certainly, as we see more population movement between countries, either through immigration or through disease or war, there is a significant problem that can come with the disease burden with these individuals. So one of the issues that we were made aware of is that there is a shortage of high-quality antitoxins that frequently impact different countries that are partners of ours, and this has a very high health care burden because these are hospitalized very ill patients.

So working with the regulators, we've been able to define a pathway that would be an accelerated pathway to market. We are looking at how we can advance this very quickly, starting our investment this year and I look forward to giving you more updates on this program as we go forward.

And I'll just quickly highlight 2 other programs because I think it highlights some of the other areas of how we think about leveraging our strengths in our platforms going forward. So 2 other much earlier development stage candidates that we have, one is a ricin hyperimmune. Ricin Is a very potent antitoxin, certainly causes a lot of concerns from some of the intentional use that's happened over the last decade. And so we used our BAT platform, which supports our BAT -- our antitoxin on the equine hyperimmune, to develop an antitoxin treatment for ricin that we have in the preclinical stage at this, and we'd be looking for partnership to advance this program.

Another one that I think is really interesting, it shows our broader scope around the emerging infectious disease, is one of our monoclonal programs that's in early development. So we certainly hear a lot about Ebola. I mean, so there's an outbreak going on right now in the DRC, and I think the most devastating outbreak back in 2014, we saw a huge impact from Ebola hitting in some of West African nations. And Adam highlighted very nicely the true cost of these outbreaks isn't just the mortality that we see or the direct impact to that country that has the outbreak, but very broad impact across the world on the economy.

So thinking about how we can become a partner in response to some of these very impactful diseases, certainly, Ebola rises to the very top of the list, is one with very high mortality and, certainly, from a biothreat perspective as well as an infectious disease perspective, it garners a lot of attention.

So there has been some products that have been developed. These are really targeted to a single strain of Ebola. So what we're looking to achieve here is create something that will cover across multiple strains of Ebola. And so we have some partnerships on the monoclonal antibody side, looking at our public health agency of Canada that's

currently funding some of our key studies right now. It's a program that as we get data, we'll look to partner to bring forward as well.

So when we think about foundation then of this business unit, I've highlighted where I see our marketed products as well as our pipeline and some of the core business capabilities that we have that we'll leverage to support that future growth. And I'll just highlight some of the recent successes that we've had, and we've been exploring this strategy over the last few years.

So one of the things that we've really focused on is how we can strengthen the foundation for the business unit, looking at our partnership with the U.S. government and wanting to move to a different sustainable model for these programs, where we're able to ensure supply of these critical medical countermeasures, but also build a business that can help to support our platforms and the capabilities that are a key part of these programs. So 2 great successes that were alluded to by both Bob and Adam. We've had a successful year with being awarded a 10-year contract for the VIGIV product, which is our smallpox (inaudible) product. This is valued at up to $535 million and will really provide us an opportunity to build a solid foundation around this platform of the human hyperimmune.

In addition, we've had recently another success being awarded another 10-year commitment with the government on a contract for our botulism antitoxin, BAT product. This is valued up to $490 million. And very similarly, this gives us a lot of confidence in how we can maintain our equine hyperimmune platform and ensure that we have long-term supply of this critical countermeasure.

Also, though, beyond these contracts, I think we've invested in some key things this past few years, and I just want to highlight a couple of them here. The recent acquisition of raxibacumab, which is the monoclonal antibody to anthrax, was a very important investment for us as a business unit. This is a monoclonal that helps to expand our platforms. So as we brought this into our portfolio, we immediately started the tech transfer to some of our Emergent facilities, which will help to build those capabilities within Emergent for monoclonals. Specifically, at our Bayview facility then, which is part of our center for innovation and advanced development manufacturing. This will be one of the key anchor products, both as an FDA approved product which helps us build the capabilities around the G&P infrastructure as well as a monoclonal capability building product for that key facility.

And then I've talked a lot to how we apply our platforms to accelerate our development, shorten the time to licensure and help to de-risk them. And I think flu, which I'll talk more to, and the Zika are good examples of how we employ that adaptable platform approach.

So looking at how we see our global part of our business, certainly, we have a large geographical reach for our products, wanting to ensure that we have quality medicines available more broadly to global markets and patients around the world. So we focused on how to grow the customer base and how to ensure that we are growing access to our medicines around the world. So this is actually a snapshot of our current state, looking at our customer base, providing products both to populations at risk, military populations, as well as emergency use populations. And this is where the botulism antitoxin is a key product because it is used for endemic disease with outbreaks that occurred today.

Currently, our products then are in 36 countries around the world. And as we look to our growth strategy, I think this provides a strong foundation that we can leverage for new public health threat products that we're bringing through to market.

I want to take a moment to highlight another key innovation that we've been investing in for Emergent, and this really is a testament to how we create solutions to address these complex problems, some of what Adam highlighted, and really leverage what we're good at as a company. So Emergent is a leader in Biologics manufacturing. As you could see, we have many manufacturing facilities that have very specific expertise. And one of the things that we also are good at is partnering in this idea of search capacity and the ability to meet new product demand. So that's part of the CIDM that I referenced, that's a concept across our facilities.

But when we look at our facilities, there is a limit to how we can respond to new disease threats. And these are centralized facilities at certain scale. And so one of the things that we were looking at as a challenge is how can we bring more of our products to the patients and the areas that need the most and leverage our experience in infrastructure.

So as we looked at how to create a solution, we really were focused on how to take our brick-and-mortar G&P facilities and processes and transform them in a way that would allow us to take manufacturing into the field. The intent here is to really build an end-to-end solution so that we're able to create from the beginning of identifying a threat to delivering products that can go into patients in a very small footprint.

Now with a targeted investment -- incremental investment, I would say, at this point in time, we're actually able to build a prototype unit that we've been functionally executing on. We're in the process of validating this, which I think is really exciting. And one of the key things, as we go into the future, is really working closely with our partners and with our regulators to define how we can bring this product forward and the impact that it can have.

So again, the concept here is to take manufacturing into the field more closer to the point at which is needed, which is a very disruptive way of thinking about supplying your products to the patients in the future. But also, when we think of this innovation and how it reflects some of the ongoing innovation within the manufacturing world, you hear a lot about pharmacy on demand and these future trends where manufacturing will change in the future. And so this, we really feel, puts us at the front end of some of that thinking. Also, I think more key is how we use our partnerships in order to advance this. And this has really expanded our ability to bring a number of new partnerships to our business unit, working very globally with different NGOs and partners or ministries of health around the world, and really helps to establish Emergent as a thought leader in those areas.

So then I want to talk more about our future state here and how we're going to take this foundation that I've outlined for you in the business unit and really use it to build meaningful growth for the company. So I think we've covered what we believe is a strong foundation. And when we think of how we're going to build on that foundation, I think there's good momentum. There's good science within this business unit, some great platforms that we can really leverage, and now what we're looking to do is expand beyond that core business.

Really, our leadership position in therapeutics today will continue to support us into the future, and we'll take a look at broader public health threats in order to leverage those key competencies. We'll be expanding our commercial portfolio and capabilities, and I think this is a key part of our story. As we look to expand our revenue streams and move more into commercial markets, we've identified the acute care markets as being the area of focus for this business unit.

I think we'll continue to look at being a solution provider and how we can leverage our experience, platforms and our new focus in our pipelines on ways to provide this rapid response capability that really help us address a broader threat landscape. And then we'll be making investments in the next 5 years to look at that next generation of therapeutics to ensure that we have that future leadership position.

So overall, this provides us, I think, a strong growth strategy for how we will scale and grow the business. I think we have a lot of momentum, I've described here, that we'll continue to build on.

So why the acute care space? I think for Emergent, we have a very strong leadership position in the medical countermeasures and certainly address a number of infectious disease. And as you see, we've been expanding that into emerging infectious disease. I think when you look at that (inaudible) medical countermeasure landscape, there are a number of threats that we're not addressing that I think we can expand our aperture and create growth within that core business by addressing. And I think also, as we look to diversifying our business and moving more into the acute care space, this really is a natural evolution of our business. Many of our products today, either for infectious disease or acute threats, these are treated within the hospital space. And we'll continue to look at that hospital and specialty market space as our area of growth. We think this is an area that has very high unmet need, and so it's got the opportunity for high-volume growth within that segment. I quote some alarming numbers here and you look across the world, but just looking at each year, the burden of the number of people that are admitted to hospitals is quite staggering. I think the other thing that attracts us to this market and why we think it's a good fit is although it's got some really strong commercial growth, this is also a great area where we can see synergies with our government partners, and so that dual market opportunity that we sometimes reference is really a good fit for the strengths that we currently have.

So I'll just walk you through how we see this growing over the years. So our current portfolio I highlight here, again, very focused in the medical countermeasures, both CBRNE as well as our emerging infectious disease portfolio. But you can see, we've already started some of our investment in this acute care infectious disease space. So the Botulism Antitoxin highlighted is a unique product that really covers both the biothreat as well as the endemic disease. Our lead program that I mentioned, the flu immunoglobulin, which I'll go into more detail, also fits in this space as well as our (inaudible) product. So as we look to expand in this space, I think there are some key areas that we've already identified that we'll be exploring as we move forward, both in the medical countermeasure side as well as expanding in the acute care and the infectious disease and other specialty care settings. And overall, we see that this is an area with a lot of opportunity with more than a $10 billion addressable opportunity across all 3 segments, and we think can drive strong growth for this business unit in the future.

So I mentioned one of our key programs that I'm really excited about, which is our flu program. So I wanted to walk through why this one is the one that I am very excited to bring forward. And I think that flu is a disease burden that maybe we don't think about as often or we take for granted. Probably everybody is already starting to get the reminders to vaccinate for this year's influenza. I think we underestimate the true impact of influenza, especially the seasonal influenza. Probably most people aren't getting out of bed, making that decision about whether to go to work when they've got some infectious agent happening, but they're not sure what it is or whether to get their vaccine or not. There's actually a significant amount of mortality that's associated with the flu. You can see just in the last flu season, up to 80,000 deaths just in the U.S. alone. And when we think of that disease burden across the globe, it grows even more. Beyond just the mortality, though, when we think about this as a health care threat, is we see a significant burden on the health care system through hospitalization, so very high numbers on hospitalization. And recently, BARDA started to focus on the seasonal flu, not just pandemic flu because they really see this as one of the

critical factors that could overwhelm our health care systems, as people are, obviously, in the hospitals, it's absorbing a lot of your infrastructure around the hospital, there's high mortality associated with this, often requiring respiratory support. These are all critical pinch points within our health care system that could easily overwhelm it. If we had to strain that was unexpected or not covered. And I'll just point out that these numbers that I'm showing you are present even with the approved vaccines and therapeutics and antivirals that we have today. So I think there's a clear unmet need here and certainly a health care burden that we want to address.

So when we look at the economic burden of flu then, I think there's some numbers here we pulled out. The majority of the direct cost burden for flu, it actually comes from the hospitalization, which would then be where a therapeutic could address that need and reduce hospitalization and the burden to the market. They see this as being a growing market, and there's a number of factors here as we think about why the flu market would be growing. Certainly, the aging population is a key piece of this. There is a lot of challenge around the strains, so new strains as we become more of a global world, and Abbey highlighted with the travel around the world, it certainly increases our exposure and the ability of new strains to make it very quickly around the world, but also the challenges with vaccination in some populations as well as the resistance that comes up with some of the antivirals, this all creates a market around therapeutics of growing need.

When we look at how the U.S. market will grow then, up -- the number is given here, up to 2022, where we see a strong growth in the therapeutics for flu. The U.S. market actually grows to take more than 50% of that share. So I think there is a very strong rationale for investing in flu, both on the burden that it has on our health care system to really address this public health threat as well as a strong market rationale.

So when we think about our FLU-IGIV candidate, so again, I said this is our lead candidate. We're just completing our Phase II trial looking to start our Phase III trial in 2020. I think there's a few key things here to highlight as we think about why we would be effective at addressing this need. So certainly, leveraging our platforms, as I've highlighted, our human polyclonal antibody would be a highly differentiated product here. The intent would be to use the antibody response that's natural in individuals to the flu, either that have been vaccinated or exposed to flu, to create a truly polyclonal cross protective product. Our intent is then to go into the hospitalized space. And so when you think of most of the flu therapeutics that have improved to date, they're actually in the non-hospital space, uncomplicated flu. And so where we're looking to have the most impact is in the hospital, severe influenza space. The intent then is for this product to be used actually in conjunction with standard of care, which currently includes antivirals, so we'll be looking to add benefit even beyond the antivirals. And then when we think of the benefits that we're building into our target profile for this product and what our clinical studies will be exploring, is looking at how we can both reduce the ICU and hospital time, reduce the amount of support for patients when they're in the hospital, and of course, looking to influence, reduce the potential mortality.

I wanted to just walk through in a little more detail how we're leveraging our platforms in order to support this program. Looking at how we've leveraged our broad safety profile across all of our high premiums. This is really key when you think of taking a new product into market because, obviously, safety is one of the key critical factors that often leads to products not going forward. So we already have a very broad database that allows us to leverage that in multiple populations and gives us a strong understanding as we bring a new product forward. We're leveraging a lot of our expertise around plasma. So I mentioned that we've got a long-term history on plasma collection. But beyond that, it's really understanding how to find the right antibodies and pool them to make an effective dose. Obviously, our manufacturing facilities are a key part, looking at leveraging our GMP validated process. It just takes one checkmark out of the development program since we already have that well established. And we'll continue to partner as we bring a product forward like this. BARDA and [NH] are 2 key partners of ours who have already invested heavily in this space in defining the clinical endpoints that will be effective for flu. And we do have plan next year, a scientific advisory board will really take our data to the experts and understand how to best design our Phase III trial.

So I'll just quickly highlight why we think this is a good strategic fit when we look at this program and why I'm excited about it. Really, I think this addresses a large unmet need is a key growth factor for us in our future strategy and helps us diversify into those commercial revenue streams. I think that also we see some potential here as an orphan drug designation and the ability for us to have an impact through our partnerships.

Moving over then to the product differentiation. I think there's an opportunity to significantly improve on the current standard of care. And I sort of referenced the polyclonal approach, which is really key to this rather than a monoclonal, which is targeting a single epitope. We're really looking to have sort of multiple mechanisms of actions present, which should provide a broader coverage as well as a broader window for intervention. So that's a key differentiator for us.

So in conclusion, and I think I'm out of time here. I just want to leave you with a couple of key takeaways as we think about this business unit growth strategy and how we're growing and transforming and scaling our business. So we do see significant growth as we look at our core business, and we'll continue to build as leaders in therapeutics and really build off that foundation that I referenced with our long-term contracts that give us a strong financial foundation as well as a strong foundation for our platforms. We'll look to expand as well into this commercial portfolio and capabilities focused on that acute care market. And we'll continue to build a pipeline of highly differentiated products, both

leveraging our core capabilities, but also looking to build external partnerships that really expand our capabilities and bring in new targets and capabilities through M&A to drive that long-term growth.

So thank you for your time. I'm going to call my colleagues up for our question-and-answer period now. Thanks.

QUESTIONS AND ANSWERS

Answer – Robert G. Burrows: All right. Shall we start?

Analyst: Dana Carver Flanders, Guggenheim Securities, LLC, Research Division - Senior Analyst

Question – Dana Carver Flanders: Dana Flanders from Guggenheim. Mine is just -- maybe, Bob, can you speak to the 2024 revenue targets that you've put out? And how we should think about the contribution from M&A versus organic growth and pipeline?

Answer – Robert G. Kramer: Sure. So at the risk of stealing some soundbites from Rich, who will follow here shortly, Dana, we look at organic growth opportunities in that mid- to high single-digit growth rate for the organic business. But I would caution everyone to -- when you look at how we could potentially grow the business from the $1 billion today to $2 billion in the next 5 years, there's not one path, there are multiple ways to get to that $2 billion number. And similar to the 2016 through 2020 growth strategy cycle, there are ways to get to that $2 billion number through organic growth only, whether it's in the vaccine business, the devices business, the therapeutics, the CDMO, which is to take nothing away from our interest and commitment to continue to look for strategically aligned and financially disciplined M&A opportunities. But the way we look at the kind of the base case is that organic growth component is likely to be in that mid- to upper single-digit growth rate. Hopefully, that's helpful.

Analyst: Jessica Macomber Fye, JP Morgan Chase & Co, Research Division - Analyst

Question – Jessica Macomber Fye: Great. Jess Fye, JPMorgan. Following up on Dana's question on the guidance. Within that organic growth you're talking about, how much of that is from new products, i.e., the pipeline? And how much of -- I guess, what's your assumption for NARCAN within that 2024 number?

Answer – Robert G. Kramer: Sure. So that mid-single-digit to upper single-digit growth rate, just for the organic piece, that's a blended kind of percentage for the entirety of what we have today. We're not assuming, as part of the $2 billion number, any meaningful revenue coming from new products that are in development today. It's more about, as you heard from Abbey and from Laura, making sure that our development pipeline is well positioned toward the end of this 2020 through 2024 period to generate top line revenue in the next 5-year period. In terms of NARCAN, I'm going to hold off on answering that until Doug gets up and goes through his presentation. But I think as you've heard from us, both on earnings calls and as part of conferences, we continue to be enthusiastic and excited to the risk of overusing that word about the future for NARCAN nasal spray. As you know and we started and made the announcement of the acquisition a little more than a year ago, we were looking at run rate for revenue in that $200 million range per year. We've updated now twice since then, and Doug will talk about some of the key drivers of potential growth in both the public interest market as well as the retail market, but we continue to be encouraged by the pull-through of that product. But importantly, it's not just about the revenue numbers. For us, as you'll hear from Doug, our focus continues to be, and Adam alluded to this earlier, on making sure that access and education and affordability of this critically needed naloxone product is made available to a growing number of patients who need it.

Analyst: Brandon Richard Folkes, Cantor Fitzgerald & Co., Research Division - Analyst

Question – Brandon Richard Folkes: Brandon Folkes from Cantor Fitzgerald. On the chikungunya opportunity, you've provided a market -- a global market size of $300 million to $500 million. Can you just help us think about how the U.S. and EU makes up that $300 million to $500 million, even if it's just qualitatively?

Answer – Abigail L. Jenkins: Sure. I think the number that I would use is I would go back to the projections for the travel market at large. We believe it's growing from $3 billion to $5 billion. And when we look at that market today, 75% of that revenue is tied to the U.S., Canada and Europe. So I would assume that it would be a similar trend. If you take $300 million to $500 million, you assume 75% would come from those 3 markets, again, largely driven by the U.S. contribution. I think you can probably come to that number.

Analyst: Boris Peaker, Cowen and Company, LLC, Research Division - MD & Senior Research Analyst

Question – Boris Peaker: Boris Peaker from Cowen. You talked about vaccines in Ebola, Zika and most of these into current third world countries. I'm just trying to kind of understand what are the economics of selling these

vaccines in third world countries? While the numbers are very large in terms of patient population, just what are the economics there?

Answer – Abigail L. Jenkins: Just to clarify, I think Laura talked about the antibody products or therapeutic products in Zika and Ebola. Right now, we don't have any vaccines in development for those 2 categories. But to answer your broader question around how do we think about the endemic markets at large, I think that's something that we're continuing to explore for now. We're focused on the markets where there's an immediate opportunity to benefit the patient population, looking mostly from the travel side. As we go forward, I think we'll explore how we may be able to have a broader contribution in those endemic countries.

Answer – Robert G. Kramer: Yes, maybe something to add there. I think this was something I didn't make, as we were talking about the circle was there's this intersection of emerging infectious diseases, travel health and biodefense. And I think our approach to Zika and Ebola in the past has been to work with a government or a funding agency to seed or

(technical difficulty)

in with them around innovation. And then in many cases, I think those endemic areas, those governments or organizations, like WHO, are going to have to make a market. And so I think the economics have to go with something like that for us to, I think, go at that aggressively.

Answer – Abigail L. Jenkins: And I'll just add, I think that's consistent with how we've approached both the Zika and the Ebola in our pipeline. So really looking to leverage. Our partnerships offset our investment. But I think it is key as we think of how these grow in the future. We often think of them as diseases that happen in the rest of the world, but they can very quickly be diseases that are impacting at home, which certainly then there is a more addressable market.

Analyst: Jessica Macomber Fye, JP Morgan Chase & Co, Research Division - Analyst

Question – Jessica Macomber Fye: Great. Jess Fye. Just a couple more questions. When could the chikungunya vaccine launch? And then with respect to the FLU-IGIV product, just with generic Tamiflu, do you plan to generate any head-to-head data to establish better efficacy? Or how do you plan to position that product with a generic sort of in the acute flu setting?

Answer – Abigail L. Jenkins: I'm taking that chikungunya question first. An important factor will be our conversations with regulators in both the U.S. and Europe. I think if we initiate our Phase III trial as planned in 2020, within a few years of that and depending on where we are in the order of entry hitting the market, that will really influence. But I think within the next few years, we believe it's possible to bring a chikungunya vaccine to the market.

Answer – Laura Saward: And then on the FLU-IGIV side, so when we look at the sort of the differentiated profile for a product like this, the intent is that it really has a different mechanism of action to treat acute flu because it's really binding the virus as well as neutralizing it. And so when we think of looking at its added benefit to antivirals, such as Tamiflu, we're actually running our Phase II and then tender a Phase III trial to include antivirals in the standard of care. Even though they are not currently licensed for that, I think it's just accepted that without any other options, they're just generally being used at this time. So our data should answer that question.

Analyst: Keay Thomas Nakae, Chardan Capital Markets, LLC, Research Division - Senior Research Analyst of Therapeutics, Devices and Diagnostics

Question – Keay Thomas Nakae: Keay Nakae from Chardan. For Abbey, to capitalize on that market opportunity for check, what kind of investments are you going to need to make in sales and marketing?

Answer – Abigail L. Jenkins: That's a great question. I think the first and foremost opportunity for us is to establish the science around chikungunya. For those of you who may have listened to the VERPAC meeting, a common theme throughout the day at that advisory committee was the lack of evidence, the lack of information that's known around the epidemiology, the prevalence and the burden of disease, both from an acute and chronic perspective. And we want Emergent to play a critical role in helping to generate some of that information that will be important for shaping the market. So I think that's the first investment, it's just convening a community of experts in this area, understanding what science is possible, what's available, what's possible and helping to bring that science forward into the market. We don't believe we have an established infrastructure for travel health that came with our acquisition of PaxVax. We really feel that this is a great opportunity to maximize the investment of our travel health team, adding another product into the bag. So we don't expect that there's going to be a significant expansion in the number of representatives that we have. And through the digital marketing that we've done in the market research, we found that we have the ability to have very targeted digital marketing that can reach travelers. So I would see this as a relatively incremental investment on the base that we've already established.

Answer – Robert G. Kramer: I think it's a great -- just to add to that. I think it's an example. And I think each of the business units have examples of this. When we talk about scale, this is one of the areas that I think we're talking about, where we've got -- we're trying to build a leadership position through a core competency that we've either acquired or established. The thought leadership piece is definitely an investment, but this isn't a doubling of our sales force, essentially, but it's building on that base in many different ways.

Question – Keay Thomas Nakae: Can you remind us what your headcount there is in that sales organization?

Answer – Abigail L. Jenkins: Sure. We actually have a global sales force that's focused today on the U.S. and Europe. We have about 40 people who are account managers. We have a group of people that focus on frontline in-field account management, which is about 12 to 15 people. We also have inside sales representatives who make outbound calls, and that's another cost-effective investment that we have to generate leads that the field team takes advantage of. We have national account managers, about 4 of them, who call on integrated delivery networks, pharmacies and passport health, franchises and corporate passport health. And we have a very small, about 10 people who are outside the U.S., focused in Europe who call similarly on the key health care providers on the travel health space outside the U.S. We're in the process of creating an infrastructure for Canada. We have an external partnership with Valneva right now in Canada, and we'll be moving our business in-house to take over Vivotif starting in 2020. So if you think about it, we've got probably 50 or 60 people globally in various capacities that support this business. It's a very lean and targeted field force to a select group of customers.

Analyst: Dana Carver Flanders, Guggenheim Securities, LLC, Research Division - Senior Analyst

Question – Dana Carver Flanders: Dana Flanders, again. Can you just speak to your margin targets. I know it's not much, but there's a little bit of degradation from your prior targets. And I'm surprised, given the platform that you've built, maybe you wouldn't have seen a little bit of margin expansion. So just maybe help us understand the pushes and pulls there? And then also on chikungunya, I know there was some discussion on this at the panel, but if the FDA isn't comfortable with the surrogate endpoint, how are you thinking about kind of the clinical pathway forward? And if you think the cost of an RCT is something that you'd be willing to take on?

Answer – Robert G. Kramer: So I'll take the margin. Thanks for the question, Dana, the margin question first, and again, Rich will get into more detail on this later this morning. But when we look at margin, I mean, our margin, whether it's expressed as gross margin or adjusted EBITDA contribution as a percent of revenue is highly influenced by the mix of products that we have in that portfolio. Right now our product versus services mix of revenue is in that 80% to 20% range. And then there's further variability within the gross margin, in particular, within that 80% product margin area. So that's what's driving it. Again, when we looked at what we wanted to accomplish, I thought we've been accomplished with the business in this 2020 through 2024 area in this $2 billion number. We set the adjusted EBITDA target at 27% to 30% in order to give ourselves a little bit of flexibility because we know that during this next 5-year period, we're going to -- and again, you'll hear it over and over again from us, build and scale the leadership positions in this growing public health threat market that positions the company well for growth well beyond the 2024 period. So if we have to invest in commercial capabilities, which Abbey has discussed, or an R&D portfolio or any of the other governance and administrative areas, we'll do that, but it will be in furtherance of making sure we hit those revenue and profitability targets longer term. And you'll hear more when both Sean and Syed talk about the CDMO business and our manufacturing infrastructure and how we're leveraging that for, hopefully, margin improvement as well. So there are ample opportunities for margin improvement over time. But again, we want to be a bit careful because we want to build for the long term, not just year-over-year margin improvement.

Answer – Abigail L. Jenkins: Yes, taking the chik question. So I think the bigger question is it relates to the type of trial that a Phase III trial might be, and you heard this, if you listen to the VERPAC meeting has less to do with the cost and more just the actual feasibility of finding the virus, knowing where the virus is going to go, being able to get a population, being able to set up the trial and being there kind of at the right time and the right place. I think you heard from all of the manufacturers and Marion Gruber at the end of the panel that, that seems like a bigger challenge to conducting a randomized controlled clinical trial, whether it's before a product comes to market or even after a product comes to market, the epidemiology is just too unpredictable. So for us, I think we're very interested in what we heard from the FDA, and especially in her closing remarks is that they appreciate the challenges in conducting that type of trial, that's why they originally embarked on this accelerated approval type pathway, introduce the concept of a surrogate endpoint marker and we believe that there's a lot of potential still for that to be a path for us. Should something change, obviously, we'd have to reevaluate our entire clinical program, but that's a question for a future day.

Answer – Robert G. Burrows: Seeing no further questions, we're going to take a break now and ask you to be back here at 10:50.

Answer – Abigail L. Jenkins: There's one more here.

Answer – Robert G. Kramer: Wait one more, John. A late hand.

Answer – John Bezanson: John Bezanson from Wells Fargo. Bavarian Nordic just got their recent Phase III trial back. How do you -- what are your thoughts on how that's going to impact ACAM going forward, if at all?

Answer – Robert G. Kramer: Will you take a shot?

Answer – Abigail L. Jenkins: Feel free to chime in. So I think as you saw in our presentation that smallpox remains a critical threat for the U.S. government. And smallpox vaccination with a well-established, safe and effective vaccine remains the cornerstone of what we've heard from the U.S. government as part of their preparedness strategy. So for us, I believe, and you can see with a 10-year, $2 billion contract that we believe that ACAM is well positioned to be that cornerstone for smallpox preparedness moving forward. The reasons why the Bavarian Nordic product was developed in conjunction with BARDA is because it has some limitations. It can't be used in immunocompromised patients or high-risk patients that may suffer complications from a live vaccine like ACAM2000. So it's an example where the government wants to have options, that product is providing that kind of niche protection, that's needed when a patient can't be protected with ACAM.

Answer – Robert G. Kramer: I think the other thing I'd add, Abbey and John, is really -- if you look at the profile for ACAM2000 with it being a single dose vaccine. I mean, that is ideally suited for our stockpile or HHS' stockpile for use in protecting civilians. It would be a bit clunky and awkward to rely on a multi-dose smallpox vaccine if smallpox is used as a biological weapon.

Okay. Thanks for the questions.

Answer – Robert G. Burrows: See you at 10:50.

Answer – Robert G. Kramer: Okay.

(Break)

PRESENTATION

Sean M. Kirk, Emergent BioSolutions Inc. - EVP of Manufacturing & Technical Operations

Okay. I think we're going to get started again. So if everybody could take your seat, I would appreciate it. So my name is Sean Kirk, I'm the Executive Vice President of Manufacturing and Technical Operations for Emergent. I'm also the former CDMO business unit head, and I'll get to that part in a second. Through my 16 years with the organization. I've had the distinct honor of being part of this growth journey that Bob overviewed earlier on. And the distinct privilege to be able to be a part of a team that continuously demonstrates our ability to deliver on our commitments. But I would be remiss if I didn't acknowledge the over 1,800 employees back home, who are essentially the energy behind everything we do as an organization historically and going into the future. The folks here today with you, we steer the ship, but all the folks back home, they provide the power. So many thanks to all of them.

Transitioning to the CDMO business unit. When I think back to February of 2014 and the acquisition of Cangene, we brought within our network of manufacturing operations, the Camden fill/finish facility in Baltimore. The first time I went into that facility, talked to the employees and got to understand what they do, I was very, very impressed with the customer-centricity, with the complementary nature of their culture to the historical culture of Emergent, with the technology they have and the unique niche that it carved out in the fill/finish space. That is the day the seed was planted for the future of the CDMO business unit. Between February 2014 and the creation of the CDMO business unit in April of 2017, we worked very hard to capitalize on the success of the Camden fill/finish facility.

We also recognized that our driven mergers and acquisition strategies, the unique products that we've purchased over the years to bring into the product business units also brought with them an awesome set of capabilities that Syed will talk about. We then began to formulate the beginnings of a strategy that ultimately led to the creation of the CDMO business unit in April of 2017. That strategy Syed will articulate in a few moments, but it's really dependent upon leveraging all those unique technologies and capabilities from across the network to have a very unique or concept to market service offering for our clients. We have successfully built upon that set of diverse technologies and capabilities, and we've successfully built upon that unique culture that was at Camden from that very first day back in February of 2014 when I got to know the employees there. But also the culture that Bob articulated earlier on in his opening comments, in the formative years of Emergent, we developed as an organization, a resiliency and agility and a customer-centricity that was built upon BioThrax and that culture has permeated our organization over the years. And bringing new organizations like Camden to the mix have added to that capability. Syed is going to talk a lot about the importance of that going forward.

Now we're at an inflection point for the CDMO business unit. I'm no longer the CDMO business unit head, and that's by design. We need skill and capability to take us to the next level. We need someone with talent who can drive the scalability of this business unit, drive and enhance performance in matrix across all those plant operations that also report to me and take us to the next level. To that end, we've hired Syed Husain into the organization to bring that real focused experience and expertise to Emergent and to take this business unit into the future. Syed?

Syed T. Husain, Emergent BioSolutions Inc. - Senior VP & CDMO Business Unit Head

Thank you, Sean, and good morning, everyone. First off, I'd like to thank you for taking time out of your schedule to join us on our Analyst and Investor Day. I'd like to also take a moment to introduce myself. So as Sean just mentioned, I recently joined the organization as responsible for the CDMO business unit, and it is a tremendous honor to join a team that has a demonstrated track record of success, a superior dedication to its mission and an unparalleled level of excitement that you will continue to hear throughout the day.

Now my background specifically comes from the CDMO space. Over the last 15 years, I've spent a significant amount of time with 2 CDMOs, in particular, Lonza and Alcami Corporation, both leading CDMOs within their space. And that experience has allowed me to penetrate domestic and international markets, cover multiple customer segments from small, mid and large pharma, have experience over a breadth of technologies across small molecules and large molecules. And most importantly, instill a foundation of what makes a CDMO successful. And first and foremost, it comes across from a customer standpoint, where customers are a privilege, and they're not a right.

So when you couple all that together, especially when you look at my experience from 2 stand-alone CDMOs, it naturally begs the question of why Emergent. And there's a specific reason and purpose as to why I wanted to join this exciting organization. And that is when you look at the construct of a typical embedded CDMO, it's a defensive CDMO. They look to turn it off and on, whereas it's a complete 180 here, and that is where the excitement and the vision comes in. We have a tremendous opportunity to build off the foundation and be an offensive embedded CDMO and truly serve the market that needs our unique set of capabilities and our offerings.

And one more critical aspect to mention to that is when you hear from a CDMO, they certainly want to understand what their customers go through. They certainly provide a perspective as if they are in there, in the customer shoes. But in reality, they're not because as you've already heard from some of my colleagues earlier and you will hear from other colleagues, being within the life of a company that knows what it takes to bring a product to market is a very unique experience. And having that mindset and experience as an overarching umbrella over a service-based organization is very powerful, and it's very unique.

And so with that, I'd like to kick off the presentation, specifically focused on where we are from a CDMO standpoint. And this is where Sean mentioned that we are at this critical inflection point. So there's a strong foundation that's been built. And now this inflection point is all about commercial growth. You're going to hear what we have, how we're positioning it and why we have it, but then you're also going to hear how we're actually going to leverage that and penetrate this substantial market opportunity that we have.

So what you see here in front of you is a very focused vision and strategy. And I'm going to break it down into 3 specific parts. The first aspect is molecule to market. So what that means is we have the unique ability to cover every stage of the drug development life cycle. The next aspect is Biologics development and manufacturing. So what you see in the top right-hand corner is our breadth of technology platforms. So Biologics itself is comprised of established as well as emerging technologies. So here, what you have is an organization that has expertise in mammalian, microbial, viral, plasma as well as advanced therapies. And then lastly, the services piece to that vision and strategy is comprised off of a mindset of customer-centricity, flexible capability and capacities and scalable offerings. That entire combination is very powerful and will clearly set us apart from anybody else within the industry.

So with that vision, the first step is their market. And clearly, from what you see here, there is a substantial global addressable market within the CDMO space. That $20 billion market is comprised of the technology platforms that I just alluded to earlier. So certainly, the bulk of that opportunity is within the mammalian space. It's an established technology, and there's a significant amount of innovation that comes through that technology still to this day and for years to come. But then that's also complemented across the additional technologies such as viral and vaccines, microbial, plasma and advanced therapies. And those comprise the other $5 billion in that market opportunity.

Now when you look at the market opportunity, and this substantiates that there is one, the next aspect is, are you positioned to penetrate that market? And the foundation of this company, which has been alluded to numerous times, speaks to our development and manufacturing and compliance expertise. And those facilities they were acquired for very unique capabilities. But in fact, their strategic locations position us in a very unique way to provide the service offering to penetrate that market. There is a rhyme and reason for why everything happens. And the beauty of this organization and the multitude of experience that we have across the organization, allows us to combine it at an unparalleled level.

The next aspect is when you look at the offering itself. So the offering itself is the first step of where we're going to differentiate ourselves. So what you see here in front of you is an integrated molecule-to-market pathway. And this, again, is within the umbrella of Emergent overall. So again, to the point that I alluded to earlier, we not only have taken our own products from molecule to market but now we can leverage that fundamental insight mindset to help drive innovation throughout the industry as well. And I'll continue to repeat the fact that, that is something that many people talk about. But in actuality, can they back it up, we can, and we've proven it, and we'll continue to prove that.

Now what this pathway also shows is the diversity within our CDMO business from an offering standpoint. So just put yourself in the shoes of a whether it's a small customer, small pharma and biotech, a midsize pharma and biotech or a large pharma and biotech. The moment you develop that concept, you may be thinking of going step by step, you may be prepared to make a decision to go all the way, but you want to come to a service provider that understands the life that you're in, that can offer you options, that can work with you and provide that educational approach to help turn your concept into reality. And I'll just add an example there from a case study standpoint.

So we've been in recent discussions with the customer specifically that they're very much at the early stage. They have this concept. They have this great innovation, but they don't know what needs to happen next. So that educational approach right from that onset of that discussion gives them confidence that they have an opportunity to work with someone that's not going to look at them as a transaction, but someone that will be with them every step of the way. So there's that inherent trust that's built. And in this type of offering, in this type of business, trust goes a long way because you're not just going out and buying something out of a catalog, you're actually turning a concept into a medicine that can change people's lives.

So moving on to the next aspect and I know this is a pretty significant slide with a significant amount of context. So it will be available within the material following the day. But I want to point a couple of very critical things. First and foremost, it reinforces the foundation enterprise that we had. As Sean alluded to it, and it was spoken about earlier from Adam as well, I mean this company is built off of greater than 1,400 technical and compliance professionals. They provide the power, they provide the day-to-day perspective that allows us to do what we do.

And if we just walk through this slide left to right from the top, first and foremost, you see a listing of our sites. You see a listing of the technologies that I spoke -- that I've spoken to, including some categorizations of BSL-2 and 3 as well, and that's a criticality of an offering that we have. And then you get into the middle of it, which is the capability itself. So just to ground everyone because this is a critical component. Development services, drug substance and drug product. You're looking at an organization that can handle all pieces of the supply chain to take a molecule to market.

Now the other critical piece here, which is another unique aspect of why we believe in CDMO, why we're doubling down on it and why it's going to be an integral part of the company's future is, for example, CIADM. So that capability, which starts off and Laura had mentioned this, based on this partnership with the USG out of our Baltimore facility in Bayview. Just think about that for a second. So to be 1 of the only 3 facilities in the U.S. to have that designation, there's a level of technical competence that needs to be adhered to. There's a level of trust and there's a level of appreciation that the government is instilling in us to have that.

So we have this very unique ability of not only being a premier player that's ready for surge capacity needs that the government may need, but also to take innovation through from the pharma and biotech space as well. And that CIADM capability, as you see in a different color, vertically down the column. That shows that we have the potential to carry that on throughout the entire set of facilities that we have.

And when you look at it from a technology standpoint. Again, as I mentioned, the multitude of technologies that we have. Those technologies are in certain cases in a very innovative way, all available on one site. So there's one site, for example, in Canada, that has all the boxes checked. So it can take from a plasma standpoint, a molecule-to-market opportunity, all within the same site. That is very unique, that is very exciting, and it screams the opportunity to do things as fast as possible. Now in our other sites they have a broad set of capabilities, and we've integrated it in a fashion that the customer will not feel the fact that it's on multiple sites. In fact, they will benefit from the site that in this case, their supply chain has an opportunity to be touched by different experts across the country and the world.

The last aspect is -- and you'll notice that it's similar to a pipeline type of slide that my colleagues, Laura and Abbey shared as well, but it's a perspective on capabilities. And the reason we positioned it like that is, again, to take you through the journey that this was all done with a plan in place. So each of the sites, as Sean mentioned, they were acquired for a unique capability. And once they were acquired into our network, they go through a level of development, manufacturing and compliance excellence at Emergent. And we leverage that to protect our core, build that foundational expertise of our own products and then we are able to unleash that capability to the world from a CDMO standpoint.

So you see sites that are full-fledged CDMO, and then you see sites that are right in the middle. And they're in the middle on purpose, because, again, as it's been alluded to, this business is a mainstay for the company for years to come, and we want to have that flexibility to assess the appropriate expansion opportunities based on market needs, technology advances, and ultimately, the needs of the enterprise from a business standpoint.

So this all-in-one perspective shows that we have a foundation, we're here to play, and we're going to change the game moving forward. And just to touch on a couple of the attributes because I'm sure the group is aware. So we've recently announced, and we're in the midst of a pretty substantial expansion in the drug product facility in Camden, which is at the heart of, as Sean mentioned, how we got into the CDMO space. So they will be adding additional sterile capacity from a flex fill line standpoint that should be coming on board in 2021. And that'll, again, allow us to influence innovation within the market and pave that molecule-to-market pathway.

So now that I've explained what we have, the market, it's very important to move on to how we're going to do it. And as you've seen, it's a common theme. We don't enter into spaces without ensuring that we have a proper foundation. And that foundation from a CDMO standpoint is built off of 3 strategic pillars. There's a commercial aspect, an operational aspect and the level of customer-centricity.

So first and foremost, from a commercial standpoint. What's very important there is that in order for us to be on the offensive, as I've said earlier, we want to make sure that we are going to what the market needs. So I'll touch on this later as well. But the majority of innovation is happening with small and midsize pharma and biotech. So a defensive CDMO would wait for them to come to them. But that's not us. I mean we're an offensive CDMO. So we're going to devise a sales and marketing strategy that we have a foundation built on, and we're going to scale it as well for us to bring our capabilities to that market. The customers need to focus on innovation, and we need to pave the pathway to them.

The other aspect is domestic and international expansion. So we spoke about a global addressable market. Now what's critical about that market is wherever the customer may lie, the majority of those customers will want to launch in the U.S. first, which is where we have a significant amount of experience, which is where the majority of our assets are located. So we want to make sure that we expand our global presence and bring those customers to where they want to launch, which is predominantly out of the U.S. as a first step.

And the final aspect is pipeline and portfolio management. So this is critical because we're not a one-and-done CDMO. So in order to be a CDMO for the long haul, you need to have a balanced approach between clinical, commercial as well as across the matrix of technology. So there will be a proactive effort to have a focus on pipeline and portfolio management.

The next pillar is operational. So this is, again, where the foundation starts and why it's so important in this services business is because people are not establishing a relationship just to form of relationship. I mean there is a level of complexity and inherent expertise that is needed. So that's why there needs to be a focus on harmonization of processes and systems, which we have, which we also need to do to support the rest of our business. Technology expertise across a number of platforms and then capacity and capability expansion. And there is an inherent reason why we have that in there because, again, it supports internal and external. So here, you see a CDMO organization as a part of a very substantial overall organization enterprise that wants to change the industry, not just from where we can add value but pave the way for where others can add value as well.

And then the final pillar is customer-centricity. So I referenced this earlier, and I think it's very important. That mindset of customers are privileged. They're not a right. That's not something that you can just decide to turn on and off. It needs to be built in. And as Sean saw that the first day he walked into Camden, that's something that we're building off of. And it's a common platform across the board.

Now moving over into what those pillars will lead to from a strategic initiative standpoint. So there's 8 critical initiatives that are listed here, and those are actionable growth opportunities that'll support near- and long-term performance. And I'm going to touch on each one of them because, again, they support where we are now and where we're going to go. And it's to provide that color that we have a game plan, it builds off of our foundation and it gives us the confidence that in a step-by-step way, in a focused and disciplined way, we are going to penetrate the substantial market opportunity that we have.

So the first one is increase brand awareness and expansion within the U.S. and internationally. So this is a part of the scalability effect, where we will bring our offering to where it's needed. And there are a number of innovative technology hubs within the U.S. So we're going to go to them. We're not going to wait for them to come to us. We're going to expand the appropriate levels of the organization to really penetrate the small and midsize pharma and biotech clientele because, again, that's where innovation happens and that's where they need a service provider to take them from molecule to market.

Grow with existing clients by cross-selling additional services. So this is at the heart of a scalable business. Once you establish a contracted relationship, which we can in any one of our service offerings, there's an opportunity to go left and right. And then leverage a fully integrated molecule-to-market offering. That is a substantial takeaway because there are not many organizations that can say they have that across the breadth of the technologies that we have as well as under the umbrella of inherently developing our own products. These are all examples of very clear differentiators.

Then the right side of the slide focuses on investments to meet market needs. I just gave you an example where Emergent puts its money where its mouth is, and we're investing in the capability that provides a return, and it meets the needs of the market. And we'll also continue to look at expanding into platform biologics technologies and into advanced therapies. And the platform technology example is important because when you look at platform technologies, that's typically connected to -- directly to innovation. So innovation, again, it's a core topic. There's examples that have been mentioned, and I'll touch on another one in a subsequent slide, but we're proactively looking

at that. So an organization that is on the offensive clearly does a lot of proactive things. An organization that's on the defensive, doesn't.

And then the final point is to balance between clinical and commercial. Because certainly, given the fact that it's a business unit, it's a part of an enterprise that needs it to perform to business expectations and that only happens when you're looking at it from a balanced approach standpoint versus trying to find that one-hit wonder and being a one-and-done CDMO, which is what we're not going to do.

So now this is where I get into the competitive advantages, and they're definitely sustainable, they are a good carryover from the previous 2 slides. And in my opinion, I mean this is at the heart, what creates us to be that unicorn CDMO. And I truly believe that because if you look at the pillars on here, not only individually do they provide a differentiating aspect, but when you combine them, the power of that under the umbrella that we have from Emergent and our demonstrated track record, it truly creates a unicorn opportunity because this foundational market approach, again, another example of innovation. So not waiting for opportunities to come to us, but using innovative sales and marketing techniques to go directly to the customers and bring Emergent to them.

Science and technology. So as you heard my colleague Laura mention, the innovation in the MMU concept. So we have best-in-class development and manufacturing capabilities. And we're already thinking about what can be possible in the future. This MMU technology is a clear example of where innovation meets science and technology and meets potential enterprise-wide opportunities.

And then the last 2. This speaks again to what is most important in a service-based business. Do you have a track record and can you do things as fast as possible? So the track record, I mean not only is it there from the critical attributes of being a CDMO, but it's also there from taking products to market. That is a very unique track record and opportunity that people can't combine and they can't proactively offer.

And then the final piece is the speed and flexibility. So everyone knows that time is of the essence. So being in a position where we have lived the life of why time is so important and then to translate that into offerings, whether it's just going to development services, just going to drug substance or just going to drug product or combining it all together, we have a significant amount of experience that allows us to make this a competitive advantage. And the other critical takeaway from this is, all of these competitive advantages, whether you look at it from a CDMO standpoint or from an enterprise standpoint, they're needed to support the foundation of success enterprise-wide. So they're not going anywhere. In fact, we have an opportunity to leverage it and turn it into a substantial offering.

So how that all comes together from a growth driver standpoint and why we feel that we have an opportunity to create a scalable CDMO services business is because with that toolbox that I've talked about today, we have a diverse customer base to penetrate and to create. We have the opportunity for global market expansion, and then we also have the advanced technologies expertise. So any way you chop it up, what we are bringing out to the market in an offensive way touches the critical pillars of having a scalable services business. And in this case, we're focused on CDMO, where there's a significant market and there's an opportunity to contribute to the enterprise expectations.

So finally, on the last slide, the takeaways that I'd like to highlight, which are very important, in my opinion, are that, first and foremost, the customer-centricity and scalable aspect of the CDMO business is specifically tailored and targeted towards small, mid and large pharma biotech as well as the USG, which is a very important pillar and allows us to go as upstream as possible to connect innovation to the right CDMO, which would be us.

Secondly, best-in-class technology platforms. So you see a technology breadth here that is focused on where innovation is directly tied to. And then the rapid and flexible deployment. I mean that is something that is true and true to our own interest as well as ultimately than the interest of third parties.

So in conclusion, this molecule-to-market offering that we are now going to leverage from the foundation that we have and carry it forward to the substantial inflection point of commercial growth offers us an opportunity to offer an individualized and an integrated offering to support the needs of the overall enterprise from a CDMO business unit standpoint.

So with that, I'd like to thank you for your time and introduce my colleague, Doug, that will speak to the Devices Business Unit.

C. Douglas White, Emergent BioSolutions Inc. - Senior VP & Head of Devices Business Unit

So like my colleagues, I'm very excited to share with you more details on the device business unit and our growth strategy. Just as by way of background, I came to Emergent about 2 years ago, a little over 2 years ago. I come with a long 30-year-plus career in the Medical Device segment, in particular, have worked for very large companies like Becton Dickinson, Bayer and others as well as smaller companies.

There are some interesting analogs to some of my experiences in building and developing new markets. Historically, I was at Chiron when we started in the early days of utilizing molecular diagnostic testing for HIV and hepatitis to not

only determine prognosis but also to monitor therapy. And also from more recent experience in terms of developing the market for HPV for cervical cancer screening. And in both of those cases, the innovation is what really helped us to not only garner and build the market but also sustain the market. And I see some additional applications in this business where there are parallels.

So what I'd like to do is go through our strategy, but in particular, focus on our vision. We want to be the trusted provider of innovative acute care solutions. And in particular, we want to focus on the military, first responders, clinicians and patients. And we're going to do that by building on our current market leadership position in 2 markets where we have a strong position. One is in the chemical countermeasure space, and I'll talk more about that in detail, but also in the opioid crisis, in particular with NARCAN Nasal Spray.

We also have a very innovative pipeline of products in both of those segments, and I'm excited to share with you where we're going and how we're pursuing that. And then finally, as Bob highlighted, a big part of our focus and growth strategy over the next 5 years is continuing to expand access of naloxone. We believe that there is still an underutilization and a broad opportunity to expand the market, and we'll continue to focus on that.

So in terms of our overall focus as a business, when I came to Emergent, the first thing I was started with is help us define a strategy. Where should we focus as a device business unit? I used to use the term that being the Head of the Devices Business unit was like being the Head of Molecules because there are so many different devices and areas to go. What we focused on, as part of our analysis, is to determine where does it make the most sense for us as Emergent to focus? What are our core competencies? What do we do very well? Where do we have the relationships and capabilities that can enable us to succeed? And secondly, where are there markets where there are unmet needs where innovation can actually accelerate or enable broader adoption and also remain sustainable? So the 3 markets that we focused on as a business are specialized acute care, which are chemical countermeasure business as part of, secondly, in the opioid crisis from a public health perspective, NARCAN Nasal Spray, and we also have a pipeline of innovation, not only for opioid overdose rescue but also of moving into treatment, and I'll talk more about that in a few minutes.

And then finally, we continue to monitor threat detection and diagnosis, as Adam highlighted. And in that area, we're selectively evaluating opportunities that complement the Emergent portfolio specifically in the area of emerging infectious disease, but also in the area of chemical countermeasures, where there is still a need for better detection and information available to the war fighter.

In terms of our sustainable competitive advantages, why are we going to win? Why? What's going to help you believe that we can win? I think first and foremost, as all of you are aware, we do have a market leadership position. We do have a first-mover advantage with NARCAN Nasal Spray, and I'll talk more about what that is and how we think it's sustainable. Secondly, we also have a very strong leadership position in the skin decontamination market segment of the chemical countermeasure space. So I'll talk to that as well and how we expect to build from that position to grow a sustainable and actually a winning strategy as it relates to the chemical countermeasure space.

The other area that I think is unique. And through the acquisition of Adapt, we acquired not only NARCAN Nasal Spray but a world-class commercial team. They're a unique commercial team. They have capabilities in multiple areas, and we've continued to invest in that team and expand our capabilities, not only as we focus on the public interest market that I'll talk more about, but also in the commercial retail prescription market.

And then I mentioned before, our innovative pipeline, which I'll get to in a second, believing that our pipeline will enable us to continue to grow and continue to differentiate ourselves in both of those particular segments.

And then finally, historically, we've had a very strong position in government relations and contracting, a big part of our ongoing success in getting grants and contracts for the development of next-generation auto-injectors and other APIs is because of those relationships. We also believe that as a result of that capability, we will continue to have opportunities to supply not only the federal government but also help inform and, hopefully, influence to a degree, funding for critically needed naloxone and other programs in the area of the opioid crisis.

So let's just talk briefly about our 2 products in the portfolio. You see the RSDL. It's the only FDA-approved product for not only neutralization but also removal of nerve agents in one single step. It is procured currently by the Department of Defense. We're in the third year of a 5-year contract to supply all of the branches of the military with RSDL. And we also have over 30 different countries that acquire RSDL today for their war fighters and civilians.

And secondly, I think you're all very familiar with NARCAN Nasal spray. It's the first and only FDA-approved nasal form of naloxone. It is a community-used product. It's very simple to use, and I'll show you in a bit and talk to you a bit about why we think the advantages that we have with this product and our pipeline of products is going to help us sustain a competitive edge.

In terms of our pipeline, broken into 2 different segments. At the top, looking at our chemical countermeasure portfolio. I think one thing to keep in mind that we're very excited about is that the majority of the projects that we have undertaken have been funded by the federal government, either the Department of Defense or by BARDA. And in all

cases, and I'll go into a little more detail on the chemical countermeasure space. In all cases, we're looking to develop next-generation technologies and capabilities and I'll share with you more about that. And we continue to make progress on all those projects.

Most recently, we did announce the award of a contract for PC2A, which is our diazepam application for chemical countermeasures and I'll give you some more detail on what that is and how that complements our portfolio.

On the opioid crisis side, one of the things that we acquired in addition to a world-class commercial team at NARCAN Nasal Spray is a pipeline of innovation. We plan to continue to innovate on our solutions for opioid overdose rescue including extending our stability for the current NARCAN Nasal Spray from 24 months to 36 months, and we're currently working on that. We also have innovations to start to expand out into adjacent markets. We have a prefilled syringe. We've submitted an allocation to the FDA in September. That's really targeted at EMTs and emergency rooms and really designed for clinically trained individuals, but it's a very simple, ready-to-use product.

Secondly, we have a multi-dose intranasal device that we're in development on, looking to offer first responders, a 2 dose, 4-milligram dose option for their treatment of opioid overdose individuals in the event that they may need a second dose of 4 milligrams.

And then finally, we're very excited. In September, we were awarded a grant by NIDA, to develop a long-acting nalmefene solution. This product is really targeted for treatment and sustainment of treatment and is really our 4 way -- or foray or first step into the treatment side of the equation. We plan and our goal is to be a leader in providing solutions in the opioid crisis, and we recognize that it's not just about overdose rescue, it's also about treatment, which is a major challenge and opportunity for innovation.

So I know that everybody wants to talk about NARCAN, including me. But before we go there, I think it's really, really important to understand our overall strategy because the chemical countermeasure space is a significant part of our growth strategy, and we have significant opportunity there. First and foremost, the market globally is about $150 million market. It's made up of 2 segments, skin decon, where we have a leadership position. It's about a $40 million market and then about $110 million market is the auto-injector space, where we are really just have a toehold in that space but have a great pipeline of products that we're developing to address the market.

In terms of the auto-injector space, the majority of auto-injectors are purchased by the U.S., about 57%. But globally, there are about, I guess about $110 million worth of product being purchased. We anticipate the market to grow over the next 10 years to $160 million.

A couple of points to keep in mind, the current provider of auto-injectors has been challenged with production. There is a shortage and a lack of ability for countries and even certain agencies in the U.S. government to get access to auto-injectors. As a result, the federal government is funding the development of new products, new next-generation products that have a high degree of reliability and are easy to use, and that's where we come into play. And we believe that based on that unmet need, there is an opportunity for us to take a leadership position in the chemical countermeasure space, including the auto-injector space.

So specifically, I mentioned 2 projects that we have underway that are funded by the federal government. One is D4 that we've announced historically, and we've been working on. It's really a dual-needle auto-injector for the application or for the intramuscular injection of atropine and pyridoxine, which is the combinations required. Every soldier in theater carries 3 on their person, 3 of these auto-injectors, one for themselves and one for a buddy in case they're unable to utilize it. And then the second project, which we just announced, is for PC2A, and that's our diazepam project. And that is a single unit device with a single needle, one drug. And we'd see this, the combination of these 2 auto-injectors as a base or a platform for us to build on because we're designing them, not only to meet the new FDA requirements for reliability, which is 99.999%, which is a big challenge in and of itself, but they're being designed to meet those specifications. They're also being designed at the DoD's design requirements or to their requirements so that we make sure we're going to meet their long-term needs.

And then finally, and really importantly, is they are adaptable. You can add different APIs for the future as you decide to move forward or we decide to move forward. We have a base or a platform that we can build on.

So now I'm going to transition to the NARCAN business, the opioid crisis. A couple of things to keep in mind. It's a devastating crisis. A lot of us know people have family, have friends, know of individuals that have been affected by the crisis. I mean, there's some startling statistics when you look at it. From 1999 to 2017, 220,000 people died of an opioid overdose. Just to put that in perspective, during the entire Vietnam war, 58,000 U.S. troops died. So the crisis, it's almost like we're at war. And it's very significant. Adam highlighted the cost to society. I think the other thing that I want to focus on as we start to drill down into the crisis and where we focus is the 47,000 people that died in 2017.

So when you look at the 47,000 that did die, there were really 2 unique segments that are being impacted by the opioid crisis. There are individuals in the right, the 30,000 plus that have died that are illicit drug users, using heroin and illicit drugs. And then when you look at the statistics and the number of individuals that have died, about 17,000 fit into that category of have been using a prescription opioid. Whether illicitly or not, we don't necessarily have all the

data to discriminate, but the reality is there are 2 unique populations that are at risk of an overdose. And that's what I want to share with you some details around how we look at the market and how we look to expand access of NARCAN Nasal Spray.

So one of the things that we evaluate and focus on is the pathway for an individual journey. There are about 11 million people that have used opioids illicitly, whether that be heroin, synthetics or prescription drugs. In that pathway, it's estimated that over 80% of individuals that utilize or using heroin started with an opioid prescription. So that's startling. The stats are startling. And when you think about the need to intervene in this very complex multifaceted crisis, one of the things that we focus on is how do we address all of the elements with the products that we provide, but also how we approach the market.

So I'm going to highlight just a couple of areas and then give you some more details on the different segments. But when we think about it, there's that early intervention when an individual gets a prescription, it's really important that there be counseling and a discussion around the risk, but also, in certain cases, where the opioid prescription puts them at a higher risk, the need for the education but also an offer of naloxone. I'll talk more about that in a minute.

And then as we go around and look at people that are suffering from opioid use disorder, individuals that are overdosing, it's really critical that there's enough naloxone or NARCAN, in our case, distributed in the community to enable someone to be rescued, whether that's a first responder, a loved one, a friend, a parent, whatever it might be. I guess the parent would be the loved one depending on if you like your parents or not, but a little redundant there. I love my parents, but that's okay. But the point being that we focus on the entire spectrum as it relates to individuals that are in contact and have access to providing not only information, awareness but also naloxone to make sure that if someone does have an accidental overdose that it's there, and it's present and available.

So I mentioned before, we put a lot of focus in working on the upfront side, the counseling, the understanding and education, and I'll share some on what we do with that in a minute. And then also, when you look at enabling first responders and individuals that are coming in contact with people that are overdosing from opioids, making sure that they have access. So we spend a lot of time throughout this entire chain, staying in contact. And what makes our commercial team so unique is we are designed and set up to influence and also be coordinated with all of these different organizations as you think about the opioid crisis.

So I want to come back to the point around the 17,000 that died. So when you look at just prescriptions, opioid prescriptions. In the last year, approximately 49 million prescriptions were written for opioids. That immediately puts an individual at a higher risk.

When you look at the number of individuals that are in an elevated risk because of the type of opioid prescription they're getting and this is based on CDC guidelines. So individuals receiving an opioid prescription for 50 MME or more, so a higher dose of an opioid. Those are usually people that are on long-term pain management. Anyone that is receiving an opioid regardless of dose and a benzodiazepine, and believe it or not, there's a huge number of people that are receiving both puts them at a significant risk of overdose. And then finally, individuals that have been diagnosed with opioid use disorder.

So that's 17 million people out there, and we've done some market research, in many cases, and in fact, in the majority of the cases, they're unaware of the risk that they are taking a -- they either have a combination or a higher risk prescription, and they're not really that familiar with naloxone. And from our perspective, that's a big mistake. And we need to make sure we're doing everything we can to enable that segment to understand the risk, but also offer -- have clinicians offer naloxone in the event of that accidental overdose.

Here's the tragedy. Today, throughout the United States, about 5% have actually received a naloxone prescription. That means that there's about 95% of individuals at an elevated risk that don't have naloxone in the home. So their parents or their loved ones or their son or daughter, someone's not able to immediately address the overdose.

So let's talk a little bit about why we think we have a sustainable competitive edge. And it starts with the actual device and the product. It's easy to carry. It's very simple to use. It's intuitive. That's all it takes. To save someone's life, that's all it takes. And I had it in my pocket. I'm sure you didn't know that but -- or probably could have assumed that, but it's very simple to you. So when you think about the product and our success to date, it's well understood. It's the preference of most first responders. When you think about individuals in the home, in terms of parents or relatives or loved ones, it's easy to figure out how to use right away. It's very simple. It's needless, so there's no need to use a sharps container, which you would with a needle.

And then finally, the 4-milligram dose is effective. A couple of things that I wanted to highlight is that our indication is for opioid overdose rescue. And when we say opioid overdose rescue, that means prescription drugs like OxyContin, Percocet. It also means heroin, and it also means synthetic drugs like fentanyl. Naloxone works, it's very effective. It's been proven, ask any anesthesiologist about naloxone, and they'll tell you, it's very effective for all of the drugs, specifically drugs that are opioid-based.

The other thing that I wanted to highlight is our position in the market. Today, in the retail market, we have about 96% market share of that community use segment. I think more importantly, though, 97% of individuals that have insurance, whether that's Medicare, Medicaid or private pay have coverage for NARCAN Nasal Spray. And in fact, the average copay is about $19. It's about $3 in the Medicaid segment. So about -- and frankly, 8 of the payers, the larger payers have a 0 copay. We work diligently to try to make sure that we're making NARCAN Nasal Spray as affordable as possible. And part of our commercial organization puts a heavy emphasis on working closely with the payers to help them understand the value, but also to show them the economic value of enabling broader distribution of naloxone.

In terms of our focus strategically, what we're doing, we're in lockstep with the federal government's priorities, in particular, their priorities and our priorities is to make sure that there's awareness of the risk of opioids but also awareness of the availability and effectiveness of naloxone. Secondly, its access, making sure that we have brought this broad access and availability of naloxone for those emergency situations. And then finally, affordability. We've mentioned this before in many of our calls. Since the product was launched, we've never taken an increase on our list price, don't have plans to do so. In fact, we offer a 40% discount to the public interest market, the public interest market being government, first responders, community-based organizations.

So just to give you a couple of examples of the things that we're doing in each of those categories. So in terms of maximizing access in the PIP market, public interest market, we continue to work with state and local governments to help them understand where funding is available, whether that be federal funding that can be used by the states, but also helping them understand where funds available and linking that and coordinating that with the different first responder organizations and community-based organizations -- excuse me, that's a lot of what our commercial team focuses on.

Secondly, in terms of awareness, we have a program -- several programs working with the major retail chains and helping the pharmacist and educating the pharmacists on how to counsel and discuss with the patient, but also, you'll see in some of the major chains, they actually have information available in the aisles on the availability of naloxone and programs. And sometimes they have public announcements talking about if you're receiving an opioid or a higher-dose opioid, please talk to the pharmacist about the availability of naloxone.

And then finally, the access and affordability. A lot of our programs, we talk about the coprescribing and getting to the clinicians and enabling broader distribution to that at-risk population that are getting these prescriptions. We have -- we work with multiple stakeholders, not only in talking to them about legislation but once legislation is enacted, how to better implement or how to best implement those programs and make sure that there's a broad distribution or availability of naloxone.

So I'm going to give you 2 examples of the work that we do on a daily basis and what makes us, we believe, fairly unique because of our capabilities. I'm going to show you an example of -- there are state programs today that are looking for broader distribution of naloxone to the different organizations that need it. That'd be county health, correctional facilities, law enforcement, fire departments, police departments, emergency medicine. And this programs that we've worked with them on, the states that have implemented it, the funding sources are the federal government and the state. So the funding is centrally held by the public health in some cases or other organizations. And we work closely with them to set up a portal that's integrated into our system that enables us or it enables the different organizations to order naloxone or NARCAN Nasal Spray, as needed, and then we will directly ship to them wherever they are within the state, and the bill is paid by the central body, whether that be the public health or a different organization. This is unique. We call it NARCANDirect. It's been very, very effective, and there are several states that have implemented programs, and we've seen broader distribution.

In terms of the potential, there are only a few states that have implemented programs like this. So we believe there is a significant opportunity to expand access in a number of states that we are actively working with them to continue to take this model and replicate it across the United States.

In terms of the impact of co-Rx. I'm going to give you one example state. This is California, but every state has had a similar profile in terms of the implementation of coprescribing legislation. And very specifically, what that means is, every state's got a slightly different spin on it. But in general, the idea is if an individual is getting a higher risk prescription based on the CDC guidelines, that the clinicians are required to either counsel or offer naloxone to those individuals. And in every state, as soon as legislation is implemented, we see a significant spike in the number of coprescriptions that are written for naloxone, and actually, in this case, these are coprescriptions that were dispensed.

So people ask, why the spike? What does that spike mean? The spike is really clinicians catching up with all the patients that have been on long-term pain management over the years. So they see those patients about once a month. So we see an initial spike as they work through the population that has been receiving higher-risk opioids. And then we see it start to tail off, but then it levels out. And the important thing to remember is that it levels out at about a 4x volume to what was being dispensed prior to the legislation. And we see this repeat itself over and over again.

We are aware there are states with bills pending, and they're working towards potential legislation. We obviously support that, and we will continue to work and coordinate our efforts to make sure that when they do put these programs in place, that we enable, not only from an education perspective, education of clinicians, but also making sure that we're helping to educate the population as well.

So finally, from a key takeaway perspective, just thinking about our business, we have 2 very strong core businesses, where we have a leadership position, and we plan to build on those. Secondly, we are focused on building awareness and expanding access, affordable access of NARCAN Nasal Spray and that's a big part of our growth driver over the next few years. In terms of our R&D pipeline, we have a very innovative pipeline of products. We continue -- we will continue to innovate in the area of opioid overdose rescue as well as moving into the chemical countermeasure space. And then finally, from our perspective, having a first-mover position has enabled us to not only understand the market more comprehensively but has help us build relationships and capabilities that we plan on leveraging over the 5-year plan. Thank you.

Now I'd like to introduce Atul Saran.

Atul Saran, Emergent BioSolutions Inc. - Executive VP of Corporate Development, General Counsel & Corporate Secretary

Thank you. So good morning. I was trying to figure out if it's morning or afternoon here. Good morning. My name is Atul Saran. I am the Head of Corporate Development and also the General Counsel of Emergent. I'm pleased to be here today. I've been with the company for about 2.5 years. Before this, I was the General Counsel of MacroGenics, which is a clinical-stage biopharmaceutical company. And before that, I was at MedImmune and AstraZeneca for about 11 years, where I was first in the legal department and then was heading up corporate development, the MedImmune Ventures investment fund as well as the government contract program office.

I'm going to get into a little bit of our M&A strategy today. Before I started on that, though, I just wanted to tell you what really brought me to Emergent and what got me so excited about the opportunity. And I think it's a little bit I want to pull on the thread that Adam actually raised earlier today, which is we do something that's very unique. And when we look at the corporate strategy overall, we have the opportunity to play in this public health threat space. It's hard, and there are a lot of companies that have actually backed away from playing in this space. And so one of the things that we take a great deal of pride on with our 1,800 employees is really the opportunity to make a very significant difference in this space through the collective efforts that you've heard from everybody of all the different business unit heads as well as from Bob earlier today.

So let me get started. As you heard from Bob, there's 5 core pillars of our strategy. And you've definitely heard from Adam and Sean around the overall market as well as each of our business unit heads about the organic story that we've got planned.

We also have M&A as a core part of our strategy going forward. It has been for a number of different years, and it will continue to be. But it changes slightly based on the focus of each of the strategic plans that we've laid out. And so I want to walk you through the story around how it started in 2012 and how it's built until now and then where we're going to be going for this next period between 2020 and 2024.

So past transactions have been tailored, really based on what the company needed. And if you looked at the last 7 years, we've actually executed on 7 different transactions in the last 7 years. And that's included divisions of companies, it's included sites, included individual products and different companies. And in each case, it's really helped build where we are today.

From the 2012 to 2015 time frame, the focus was around what we call the build part of the strategy. We had one product to start with, which was BioThrax. And we're moving forward and trying to figure out how do we really build upon where we are in the medical countermeasure space. So that included the acquisition of RSDL, our auto-injector technology and Cangene, which brought along with it a number of different hyperimmune products that you heard about from Laura earlier today.

In the next time period between 2016 and 2020, and most notably, over the course of the last 2 years, we've executed on 4 major transactions that have really grown our product base significantly, including ACAM2000, raxibacumab, the travel health vaccines that you heard about from Abbey as well as NARCAN Nasal Spray that Doug just talked about. Importantly, both in the first period as well as the second period, we acquired a number of different sites, and that actually led to the initiation, as Sean mentioned, of the CDMO strategy and really has allowed us to pull-through the full breadth of offerings that we can provide as Syed has mentioned.

And I'll leave you with 2 numbers to think about. The first is the #10. When we were a single-product company as BioThrax, we were looking to build upon that leadership position and really try to diversify our growth. And in doing that, we now have 10 acquired products and product candidates that drive that $600 million run rate of revenue that Bob referred to earlier. And it means that we have 3 different business lines that are each at $0.25 billion -- $0.25 billion on their own, trying to drive the business forward. So that means that we've got a diversified offering. And it's

not just a question of the products themselves. Adam was talking about the different customer bases that we have. We've really had an opportunity to diversify the business in the way that we had aspired to, and we've really been focused on driving forward over the course of the last 7 years.

The second number that I want to leave you with is $70 million. Internally, as a company, one of the things that we track very closely is the number of patients and customers that we actually are able to have an effect on. A couple of years ago, when we started the last strategic plan, we set out what we thought was an extremely ambitious objective, and we weren't actually sure how we were going to get there. But what we said was, aspirationally, we'd like to be able to protect and enhance the lives of 50 million patients by 2025. And when we laid that out in 2016, everyone looked around and said, how are we going to do that. And I will tell you, we actually hit it 7 years early. So it was last year that we actually crossed the threshold of 50 million lives, and we've continued to add to that this year, to the point that our acquisition -- merger and acquisition strategy has helped drive that growth and the M&A piece of that has contributed to 70 million lives that have been protected and enhanced by the work that we've done to date. We continue to keep that count going.

So let's talk about how that past success is driving how we're thinking about the future of M&A. As we've talked about, it's one of the core pillars of our strategy. But actually, it's one that potentiates the other 4 pieces. It's kind of part and parcel of all of them. And let's talk a little bit specifically around how it does that.

The first is that we're going to grow through an expansion of current and new markets. You heard from each of the business unit heads, where there are significant opportunities, and Adam laid out the different possibilities within the public health threat space. We think all of that, to some extent, is fair game. But the thing is, we're not going to do a deal just for the sake of doing a deal. As we've done historically, we're going to take a look and say, where are the right opportunities for us to build those key leadership positions that Bob mentioned earlier.

The second thing is that we expect to strengthen our R&D through pipeline expansion. And we have a wealth of opportunities on the R&D space. But this is drug development and device development, not everything works, and we know that. And so we're going to see opportunities to continue to grow on the R&D side. Importantly, the key question that I always get is, well, how much are you going to spend on these things? The key thing for us is we are focused on the metrics that we've laid out, which is $2 billion of revenue by 2024 and continuing to work on the profitability, which is targeting 27% to 30% of adjusted EBITDA by 2024. In the aggregate, we expect that we're going to drive towards these targets while continuing to build on the infrastructure and the rest of our strategic objectives.

The third is talking about the capabilities that we expect to build upon. When we look at an acquisition, we don't just look at it in terms of the product that may come with it, we also look at the other opportunities associated with it. And so for example, when you look at something like the Camden facility that Sean mentioned earlier, that's something that's part and parcel of our analysis. It's not something that's necessarily immediately obvious the day that you sign the deal. And sometimes, it requires an investment associated with it. And so we plan to say, hey, we may put some CapEx into that because we see a greater opportunity with that than is currently being utilized at the time.

Similarly, I think you heard from Abbey around how the sales force is laid out from the travel side. When we looked at the acquisition of PaxVax, it wasn't just simply a question of, okay, how do we get in the travel space? And are these the right products for it? It's also a question of -- this is the capability as an organization and is it the right nexus for us going from a government side to expand into the commercial side. And so these are the things that we look at when we look to expand the capabilities of the organization and something that's going to be fundamental to how we continue to look at M&A going forward.

And finally, the fourth piece that I want to talk about, and this is really critical. I think most of you know that most acquisitions in the world and in the industry failed to really result in shareholder value. And we have a very strong belief that the reason for that is that companies fail to adequately put the time, effort and resource behind integration. Integrating an acquired company is a critical piece of any M&A strategy, and particularly so in our industry where there's a significant amount of complexity at almost every level. And really understanding both from a principal standpoint, what is core and important to Emergent as well as what is unique about a particular acquisition is really important to get right. So if you look at the 4 acquisitions that we've done over the course of the last 2 years, each one of them has been a little bit different. ACAM2000 was a division of a company, and it was coming with 2 different sites. Raxibacumab was largely a tech transfer project. NARCAN Nasal Spray was a stand-alone business and PaxVax was also a stand-alone business and had multiple sites, including manufacturing in Europe. Each one of those requires a different tailored strategic approach to how we're going to implement the integration and most importantly, most critically, when we talk about the pride that we have in the 1,800 employees in the organization, how do you take folks from an Adapt, from PaxVax and from the ACAM2000 acquisition and really bring everybody together into one organization and help drive that right culture forward. And so when Bob talked this morning about evolving the culture of the organization to continue to drive growth, the benefit that we get out of scale is the ability to actually do that well. And so we spend quite a bit of time and effort to try to get that right.

So let me talk a little bit about the criteria we use. This is a question that I get often around, what is the criteria that you would use for mergers and acquisitions?

The first thing, as we've already talked about, is strategic fit. You've heard a lot about -- from Adam, in particular, around how we think about the public health threat market, and it's really a question of does it fall within the soccer ball that we've got here and does it actually make sense in terms of our ability to grow a leadership position.

The second thing is that we have a preference for products that are accretive in less than 24 months. Now is this a guarantee that they're going to be accretive? Well, no, not necessarily in that time frame. But as we recognize, the core focus is continuing to go towards that $2 billion and 27% to 30% of adjusted EBITDA. And we recognize that acquisitions that are more likely to be accretive in the shorter term are more likely to drive that piece of it. But acquisitions are complicated, as you know, they have both pieces that are revenue generating, that include products out of the market, but they may include really good R&D pipeline products that come along with it, they may have sites that come along with it. And so we evaluate all of these things holistically.

And so that brings me to my third point, which is the ability to generate risk-adjusted returns is a really critical aspect of how we evaluate these. I mean,generally speaking, our basic approach is as we look at the DCF and we understand what it looks like. But as you all know, because you all do this, it's really complicated what goes into the DCF. And so we spend a lot of time studying and understanding risk. And so let me give you a couple of examples from our past acquisitions of different types of risk that we've looked at, that we've modeled out and has really factored into our calculations when we've done acquisitions in the past.

So first, let's talk about manufacturing risk. You look at a couple of the acquisitions that we did. When we acquired ACAM2000, the Canton facility was not licensed for the manufacture of ACAM2000. We expect that the FDA would come in, they would do an inspection associated with it, and there was a question around when licensure would actually happen. And so we had to assess, do we want to acquire this pre licensure? What does that look like? How much should we pay for it? How do we adjust for that appropriately?

Similarly, when we're looking at manufacturing risk, we were looking at our site in Bern, Switzerland, which came with the PaxVax acquisition. And there are a couple of pieces to that. The first was, as Abbey mentioned, we were trying to go from a frozen version of Vaxchora to a refrigerator stable version. And the question was, as that tech transfer happens, how is that going to play out? Second thing that we looked at in that piece of it was, do we think this could be CDMO ready? Or how long would it actually take for it to be in that category? And the thing that was important about it was it had the opportunity to be a European beachhead for us from a manufacturing standpoint. And so we looked at all of these things when we looked at the manufacturing opportunity that was available to us. So that's one set of risks.

Let's talk about another one, R&D risk. R&D risk is a really important piece to evaluate and that there's lots of ups and downs associated with that. But I would say -- I think we could say that we would not be in the position that we're in with chikungunya right now if we did not really have an understanding of that. And one of the things that we did in the analysis was to try to understand what are those key attributes. Abbey talked about the 5 attributes and that -- and their target product profile that we found attractive. That was something that we spent time taking a look at to understand what would be important in the travel market and with chikungunya, in particular, if we wanted to go ahead and move ahead with that opportunity.

Different risk we evaluated, NARCAN Nasal Spray, which Doug talked about. We have a strong IP position there, and we've got a patent portfolio that covers NARCAN Nasal Spray, but we had to assess the legal risk associated with that. At the time we closed on that transaction and to this day, it's under generic challenge right now. And so we actually spent a fair amount of time trying to understand, okay, what are the legal risks associated with it? How strong do we think that IP portfolio is? And we make the investment once we have a good understanding of what that actually looks like.

And then the fourth one, I'll say, and there are many others, I'm sure, but they're -- the fourth one that I think is really interesting and important is, how do you assess commercial risk, how is this going to be successful in the marketplace. And not everything is going to work out. But I'll give you 2 examples that I think are particularly interesting. One is we looked at NARCAN Nasal Spray and had to try to understand this market. And as you all know, and as Doug, I think, outlined, it's a very, very complex set of interconnecting factors between opioid use, the opioid overdose market, the treatment market, and the thing we had to try to get our arms around was, where do we think this is going to go overall. And there's a lot of different directions that it could go. And we spent a lot of time trying to understand and analyze that. And we've been very pleased with how NARCAN Nasal Spray has been performing from a financial standpoint, but more importantly than that, the ability that we've had to be able to really have an impact from patients and customers has been absolutely critical. So that's been really a positive thing, and we feel like we had a very good understanding and handle the risks that we were undertaking and the challenges of going into the market.

Another example I would give you that was on the commercial side, let's look at the government side, that's kind of been our historical bread and butter. When we looked at ACAM2000, at the time that we acquired it, it had not been under a new contract for almost a decade. And when we took it over, the question was, okay, in addition to what I said about the facility being licensed, what was it going to take to get a new contract underway? And we had confidence that we could go through it, but we spent a fair amount of time understanding the market dynamics around what it

would take and based on our understanding of both the market overall and in this case, by market, I mean, the market created by the U.S. government, it was the opportunity that we saw to actually bring it forward, and that's what resulted in the $2 billion contract associated with ACAM2000. But importantly, it also resulted in the $535 million contract that Laura talked about related to the VIG contract because we took a holistic view of looking at what small pox prevention was actually going to look like.

So I just wanted to give you a little bit of a flavor as the types of things that we spend quite a bit of time analyzing before we decide to move ahead with an M&A transaction.

So key takeaways before I hand it over, the first thing is we want to continue to grow through M&A in both new and existing markets. And what that really means is we're going to continue to drive forward in establishing these leadership positions. We've really got a very strong organic business that you heard from each of the business unit heads. And so we're not going to do it -- do an M&A transaction simply for the sake of doing it. We're going to do it if we believe it builds on the other 4 pillars that we have. It allows us to get both breadth and depth in different areas, but it's different, importantly, from the way it was during the last 2 strategic periods. And the first one, it was about building, and the second one, it was about diversifying. We've accomplished both of those. And so really, what we're focusing on now is really trying to figure out how do we get the benefit of scale and by scale, what I mean is, how do we really establish those leadership positions, how do we take what we have here right now and really help to drive to that next level of leadership.

The second piece is to leverage our strong integration capabilities. And I think, I laid this out already, but I think it's really important to us that we continue to focus on and drive on integration as a key part of how we succeed. And then third one is continuing along the track record of successful, disciplined M&A. And I'm going to focus on the discipline piece here, which is particularly around how we assess the risks that are important to the organization, how we look at the benefits, how we look at the opportunities and how we look at our capabilities and scale and really being able to drive that success.

So I think we're going to take some questions in a little bit. But before we do that, you get to hear about the finances from our Chief Financial Officer, Rich Lindahl.

Richard S. Lindahl, Emergent BioSolutions Inc. - Executive VP, CFO & Treasurer

Okay. Thanks, Atul, and good afternoon, everyone. I'm pleased to be here today. My name is Rich Lindahl. I've been with the company for about 1.5 years now. For the past 20 years, I've been a financial officer in publicly traded companies. First as Corporate Treasurer of Nextel and then with Sprint, then as CFO of the Corporate Executive Board Company and now as Chief Financial Officer of Emergent. And so I hope you've enjoyed our presentation so far. And I've gotten a better appreciation for the tremendous growth potential that we see in the business, which, frankly, is the main reason why I decided to come join the company.

We've -- what I'd be happy to talk to you about is to put a financial lens on the discussion here to put our history and our future outlook into perspective.

So let's turn -- well, let's talk first about what I'm going to lay out here for you today. First, we've had a consistent record of operational execution and value creation over our 21-year history, and particularly, over the past several years of the multiphase growth plan that we put in place. Second, as you've been hearing throughout the day, we have a clear strategic plan to drive our opportunity set and to create value. Third, we're focused on prudent capital deployment. We have a strong balance sheet with ample liquidity, cash flow and the flexibility to fund our growth plan. And finally, that we are fully committed to creating shareholder value over time.

So let's turn to our track record of execution. You can see, starting with revenue here. Over the past 7 years, we've taken revenue from just under $300 million to -- we've guided to $1.1 billion for this year. That is a fourfold increase in our revenue base, and that represents a compound annual rate of growth of 22% over this time period. And you can see that we've done that by diversifying our revenue base significantly over this period of time. On the right-hand side of the page, you can see that from 2012, where we had one product, BioThrax, representing about 80% of our revenue base, we've grown to 10 products and grown revenue to -- over the last 12 months, to over $1 billion. And of those products, you can see that about 60% of the revenue is coming from our ACAM2000 product, our anthrax vaccine franchise and also our NARCAN Nasal Spray business. So as you can see, we are now in a position where we have a large and diversified base of revenue from which to drive growth going forward.

Now I do want to -- before I turn to the next page, I do want to hover just for a moment, on this trailing 12-month revenue figure, which, as you can see, is over $1 billion, which getting to $1 billion was a key component of our last phase of our strategic plan. Now the list of companies that have started from 0 revenue is very, very long, right? There's lots and lots of companies that have been started over time. The list of companies that have made it to the $1 billion revenue threshold is very small, probably less than 1%. So we have now joined an elite club, passing that $1 billion milestone, and that's something that we're very proud of, and I think is a huge testament to the resilience and the mental toughness and the ability of this leadership team over time to achieve winning goals.

So let's turn to the next slide and talk a little bit about our profitability. You can see that this growth in top line has driven a similarly strong growth in our profitability measures. And I'll note that we've been able to sustain a comparable growth of profitability, even as we've diversified our mix of revenue away from, again, a single focus on products to a number of other products and also introducing the CDMO services revenue. So despite that, we've maintained EBITDA growth basically in line with our top line revenue growth and also adjusted net income growth in the 16% area.

Now this powerful combination, strong revenue growth and profit growth together, has fueled substantial gains in the value created by the Emergent platform. You can see, since the company went public in 2006, we have generated a cumulative return of 335% for investors in the IPO, that represents a 12% compound annual growth rate over a 13-year period. And you can also see that, that return has been generated over multiple time frames, and that we have exceeded the returns of the S&P 500, the S&P MidCap Index and the Nasdaq Biotech Index. So what this chart tells you is that for patient, long-term oriented investors, they have been rewarded over multiple time frames.

Now earlier today and throughout the day today, you've heard our management team describe the many opportunities that our strategy provides to drive incremental revenue and growth, and create value as we penetrate our target markets. I'm not going to repeat all of their points here, but I do think it's important to bear this in mind as context for the financial targets that we've put out as part of our 2020 to 2024 strategy. So in particular, I want to remind you that we have an expanded view of what the public health threats market represents. The bio-defense market, which was core to the earlier days of the business, still is an attractive opportunity. It's very large, and it continues to grow, and it's available across all of our business units. There are then additional multibillion-dollar addressable markets available to all of our business units. And this, in turn, opens up complementary surface area for our CDMO business to pursue, as you heard Syed described earlier today. So our strategy contemplates expanding on our current base business, both organically, and you heard Bob mention in the Q&A session that we expect organic growth in the mid- to high single-digit growth rate range as well as through intelligent and disciplined M&A in order to achieve an increasing share of these attractive addressable markets.

So the targets that we've generated -- that we've put out there. First, to exceed $2 billion of revenue by 2024, and while doing so, to maintain margins in a range of 27% to 30%. And I will dive deeper into these elements in just a moment. But I will put into -- put out there for you that these -- we believe firmly that these are not only ambitious targets, but they're also highly achievable targets. We've done some research and looked at companies that have reached the $2 billion revenue level. And what we found is that for the companies that we looked at, it took them about 6 years to go from $1 billion in revenue to $2 billion in revenue. Now we've laid this out as a plan to get there in 5 years. So we'll have to move a little bit faster than the average company. But clearly, there's precedent for companies to be able to do this, especially in the context of the large addressable market opportunities that we just talked about.

So let's talk a little bit more about how we're going to get to over $2 billion of revenue. Now as you can see, achieving that level would represent a compound annual growth rate of 13% over this time period. And there's a number of ways that we're going to get there. First, let's talk about how we're going to get there organically and achieve that mid- to high single-digit growth rate that we talked about.

First and very importantly, is the fact that we have a very large amount of revenue that's highly visible and dependable that we can rely on in our organic business related to the medical countermeasure business that's been contracted with the federal government. Bob referenced just in the past 6 months, how we've put $3 billion of contract value in place. Now if you add on to that, additional options that can be exercised for AV7909 as well as additional contract value in our RSDL business and some other pieces, that takes that number over $4 billion that's available to us over the next 10 years and that is going to be highly predictable and available. To put that in a little bit more context, of that trailing 12 months of revenue of over $1 billion, over $500 million of that represents the products that would be represented by this contract value. Moreover, all of those contracts have price escalators built into them, so that every year, the value or the price related to these products goes up by 2% to 4%. So we have a very strong base of revenue that's going to help propel us forward as we start down that path towards growth. We'll complement that by increased demand for our commercial products. You heard Abbey talk about the opportunities in the Travel Health business as well as the potential for chikungunya over time. You've heard Doug talk about NARCAN and the opportunity -- the position that we have today, which is very strong and the opportunities that we have to continue to grow that business over time. There are select international opportunities that are available to us to expand that part of our business over time. You heard Syed talk about CDMO services and the opportunities there. And then, we will begin to realize some revenue from new product introductions, from chikungunya, from flu, from some of the auto-injector products that Doug touched on. So all of that contributes to a very robust picture as we think about the organic piece of the business. Now then we have the opportunity to complement that revenue growth with intelligent and attractive M&A. So overall, we're highly confident in achieving that $2 billion figure by 2024.

Now in terms of profitability, we have set out a target of 27% to 30% adjusted EBITDA margin in the same time period. That would represent up to 300 basis points of margin improvement from where we are today. There's a number of factors that are going to drive that. And I think, Bob touched on this a little bit during the Q&A earlier, but it starts with continuing to increase the mix of higher-margin product in the overall revenue picture. We have solid aspirations for the CDMO business. It is a little bit lower margin than our products. We think the products revenue will

continue to grow and help us provide some tailwinds to overall margin expansion there. Secondly, we can further scale the business, realize scale economies on the fixed cost in the business, whether it be manufacturing site costs, whether it be G&A, infrastructure, but there's a number of opportunities for us to gain additional margin improvement by leveraging those fixed costs. There's also initiatives in place through our operational excellence program to drive improved efficiencies in our manufacturing operations to improve capacity utilization in those sites as well that we would expect to also contribute to that margin expansion.

Now offsetting that will be investments in the business, whether it be in some commercial infrastructure, whether it be in new capabilities to support growth, whether it be importantly in R&D expenditures as well to create products and revenue streams for the future, not just for 2024, but importantly, probably more importantly, for the period beyond that. But we have the ability to manage those investments in the context of realizing improvements in our overall margin structure. So we're very confident that we can reach these goals and that we can continue to grow and support this growth in a financially disciplined way.

So now I'd like to talk to you a little bit about our approach to capital allocation. Now we are absolutely committed to allocating capital prudently and continuing to generate intelligent adjusted risk -- risk-adjusted returns on the investments that we make. So our first priority is going to be to fund the organic growth potential in the business. We're going to continue to invest in R&D opportunities to, again, generate revenue streams now and for the future, also to invest in operational capabilities to help us realize that growth and efficiently scale the business over time. We are going to acquire strategic assets that have the appropriate return profile and that can complement our overall objectives. We're going to manage our balance sheet carefully and prudently. I'll talk a little bit more about our targets for leverage and such in just a moment.

And then, again, our first priority is going to be to invest in the business, to invest for growth, to realize opportunities, to expand the value we're creating in the business. Having done all of that, we'll stay aware of potential opportunities to return capital to shareholders. But again, the first priority is going to be to invest in the business.

So let's talk about our balance sheet. So we have a very strong balance sheet, very solid capital structure today. We're in a very strong liquidity position, as you can see from the chart, $140 million of cash at September 30, complemented by $280 million of accounts receivable. This receivable tends to be collected very quickly as a large percentage of it is with the federal government. In addition to that, we have $215 million of undrawn availability under our revolver. And so you can see that we have significant liquidity and flexibility to pursue a wide range of small to medium-sized acquisitions without having to raise any additional financing whatsoever.

We also have a credit profile that as it stands today, is very, very solid. Based on our September 30 balances for debt and cash and our projected EBITDA based on our guidance range, we would end the year in a range of kind of 2.2 to 2.4x net debt to adjusted EBITDA. So very reasonable place to be and very much consistent with the target that we've set out historically of operating in a range of 2 to 3x net debt to adjusted EBITDA.

Now we've also said that for the right opportunity that had the right characteristics, including the ability to deleverage rapidly after an acquisition was closed, we'd consider taking our leverage up, perhaps as high as 4x, again, in the context of it being an attractive investment, something that we see positive risk-adjusted returns for and that we can deleverage afterwards. So we have significant flexibility from that perspective as well.

Now we've demonstrated strong access to capital over time. Our current credit facility is comprised of a bank group of 21 different banks that represent a range of money center banks, regional players as well as global institutions. We have very positive relationships with them. In addition, this credit profile, we believe, would be attractive in other markets for capital, whether it be institutional loans, high yield debt, converts, et cetera. So we're very confident that as we look at investments in the future, as we look at opportunities, we have the ability to fund a range of those opportunities going forward.

So just to summarize, again, over time, especially over the past 7 years, we've demonstrated a highly consistent record of operational excellence and creating value for shareholders. Our strategic plan, as you've heard in great detail during the day today, creates many opportunities for us to expand the surface area that we can go forward and to capture scale. We'll remain focused on disciplined financial management and prudent capital deployment. We have a strong balance sheet and capital structure that gives us significant financial flexibility, and we are absolutely committed to driving shareholder value as we go forward from here. So overall, we have a very strong financial foundation that supports our strategic objectives.

So thank you very much. And with that, I will turn it over to Bob for some closing comments.

Robert G. Kramer, Emergent BioSolutions Inc. - CEO, President & Director

Thank you, Rich. It's been a long morning. Thank you for your patience and attention. Hopefully, you've gotten some value out of this. And going back to my -- one of my earlier comments, hopefully, you have a greater appreciation for the strength of the leadership team that we have at Emergent, and I'd like to thank all of my colleagues for some really great presentations and kind of putting it out there in terms of their level of excitement and commitment to the

business. Again, we are in a very strong position, and I think, in a unique and an inflection point for where we want to take this business over the next 5 years.

I have 3 just very simple takeaways, and then we're going to get to Q&A. The first is to pick up on a theme from Adam earlier, which is, we think there's real value in being the go-to organization when it comes to putting in place solutions for complex public health threats. There's value to the patients and customers that we serve in furtherance of our mission to protect and enhance life. There's value to our shareholders. There's value to our employees. And there's value to the communities in which we live and operate through our corporate social responsibility programs. So our aspiration of being that go-to company is key and what drives and motivates us going forward. The second takeaway, I hope you take from this, is that as we view this expanding and growing public health threat market, it is large; it is available for us to strategically compete in select areas where we think our core competencies and capabilities that we've generated over the last 21 years can be put to use. And the third takeaway is, you've heard this, and I'm going to repeat it again, from all of my colleagues, there is a unique opportunity here to build and scale leadership positions in that public health threat market, that will look and feel different as to whether you're in the CDMO business that Syed is managing, their ability to scale our operations and leverage the capabilities we have to apply to diverse customers and patients going forward, to improve margins, that's what scale looks like in the CDMO business unit. It will look different in Abbey's vaccine business unit, where we're looking to leverage and scale capabilities that we built and acquired in furtherance of additional public health threat markets, particularly in the travelers health space. That scale and bill looks different in Laura's business unit, where we're looking to leverage licensed platform technologies upon which to develop and commercialize new medical countermeasures for different patients and customers. And it looks different in Doug's area, where we're looking to build upon the success of the prior Adapt organization and leverage the capabilities and technology that we have to meet this opioid crisis that has plagued our country and is unfortunately claiming the lives of many people on a daily basis. So build and scale is the theme. Just like diversification was the theme in the 2016 through 2020 period, building and scaling leadership positions will be something you hear over and over from us going forward.

With that, I'll leave you with one parting comment, which is for 2024 and picking up on a theme that Atul brought up earlier, the 70 million lives protected or enhanced and we're currently, I think, at something closer to 80 million to 85 million, we have now set a new target for the end of 2030 to protect and enhance over 1 billion lives. That's a huge impact. It's directly related to our protect and enhance lives. I can't tell you exactly how we're going to get there, but I couldn't tell you how we're going to get there when we set the $50 million number 4 years ago. But I think you get a sense for the opportunities that are right in front of us and the capabilities that we have in the organization, and most importantly, the leadership team that is here to drive that growth going forward.

So with that, I think, we'll take a pause, and I'll invite my colleagues from the last round of presentations to come up and we'll do a 20-minute Q&A session. And then we're going to break and give you some food and let you enjoy interacting with the management team.

QUESTIONS AND ANSWERS

Answer – Robert G. Kramer: All right. Jess.

Analyst: Jessica Macomber Fye, JP Morgan Chase & Co, Research Division - Analyst

Question – Jessica Macomber Fye: Jessica Fye, JPMorgan. Just following up on the one from the earlier session. What's the assumption for NARCAN in the 2024 revenue guidance?

Answer – Robert G. Kramer: Doug, do you want to take that?

Answer – C. Douglas White: Well, we're not sharing that at this point in time, frankly. But needless to say, the NARCAN franchise, which includes the current version of NARCAN Nasal Spray, will continue to be a big portion of our growth through the 5-year plan.

Question – Jessica Macomber Fye: (inaudible)

Answer – C. Douglas White: We're not communicating that at this time.

Answer – Robert G. Kramer: I think, Jess, I think you can all appreciate, this opioid epidemic and crisis is continuing to evolve and unfold. And while I know everyone wants to know, us included, what that ultimate market share and size of revenue could be, our focus is on that 17 million patient number, Doug included in his slides, which are people at risk according to CDC guidelines from the opioid overdose and doing everything we can to drive awareness, education and affordability of naloxone products. Doug mentioned it, but just to put perhaps a harder thumbprint on it, when you talk to HHS or talk to CDC or talk to the Surgeon General as we do all the time, their priorities for dealing with the opioid crisis are completely in line with ours. If you look at the Surgeon General's advisory statement from 2016, he drives home very clearly, the single most important thing to do is to drive awareness of the importance of naloxone, how to get it and to make sure that you keep it on your person because we all know that timely access to

naloxone will save lives. So that's our focus. I know everybody wants to know what we think about the ultimate market for naloxone and NARCAN Nasal Spray, but quite frankly, it is a huge range. There's huge upside there. But obviously, we're going through; we're acclimating the business; we're understanding patients in that public interest market, in the retail market. We think there's significant upside, but we're going to be very careful about, again, attending to the patients in the 17 million people who are at risk, first and foremost.

Analyst: Brandon Richard Folkes, Cantor Fitzgerald & Co., Research Division - Analyst

Question – Brandon Richard Folkes: Brandon Folkes from Cantor Fitzgerald. Firstly, just continuing on the NARCAN theme. Can you give your thoughts around potential 8-milligram naloxone coming to market and some of the challenges that, that may present switching away from NARCAN? And then maybe just to try tease out a bit of what's in the guidance for NARCAN. Abbey talked earlier about the Travel Vaccines portfolio potentially generating $500 million in revenue within 5 to 10 years. Any commentary you can talk about how you think about the Travel Vaccines portfolio growing from now through 2024?

Answer – Robert G. Kramer: Doug, do you want to take the first one?

Answer – C. Douglas White: Yes. So in terms of potential 8-milligram dose, we're aware, Insys had a product that's been -- the application has been submitted to the FDA. Hikma has acquired those assets. We aren't clear on where they are in that process. It would -- it's our interpretation that moving to an 8-milligram dose for intranasal device may require advisory panel review and discussion. And we say that only because our history with NARCAN Nasal Spray was, there was concern about 4 milligrams being too high from an intranasal device perspective because of the fact that once you -- they were worried about someone being resuscitated and then going into withdrawal immediately, which is a big concern at the FDA and among the panel. So while we don't speculate on the competitive entrants capabilities or success, we are planning, nonetheless, for branded competitors to enter the market, including potentially, to your point, an 8-milligram dose. I will also say that, currently, the 4-milligram dose is standard for first responders and is in specifications in each and every state. So it would be a challenge to change that overnight for sure.

Answer – Robert G. Kramer: So on the travelers market, Brandon, I think we'll see if we could hand the microphone to Abbey, let her take another stab at her thoughts on the long-term capabilities?

Answer – Abigail L. Jenkins: Sure. So I think your question was, how does the Travel Health business look in the 2024 period, is that right? So we're not prepared to give any specific guidance, but you've seen the 5 pillars of our core 5-year strategy. We want to grow the organic business. We think there could be opportunities in M&A across the portfolio, and we want to bring our pipeline forward. So we do expect that it's possible that we could launch a chikungunya vaccine within that 5-year horizon. We expect that it's possible that the AV7909 product candidate for anthrax could be approved by the FDA in that time frame. So there are a few different generators of revenue on the Travel Health side, mostly due to chikungunya, but also the continued growth of our base vaccines, Vivotif and Vaxchora. Any incremental revenue? How we get from the -- is it 5 years or is it 10-year? Certainly, it's more in the time frame of any additional acquisitions on top of our organic business, but we're not prepared to give any specific guidance on 2024 Travel Health today.

Answer – C. Douglas White: Maybe one other way to think about it, Bob, is so if you think about that kind of over $4 billion of contracted revenue and what's represented by that, that's going to grow at the kind of low end, maybe a little bit below that mid- to high single-digit range. And everything else, obviously, then is going to grow faster than that. So at the high end to maybe a little bit higher than that.

Analyst: Dana Carver Flanders, Guggenheim Securities, LLC, Research Division - Senior Analyst

Question – Dana Carver Flanders: Dana Flanders from Guggenheim. A couple of questions on NARCAN, if I could. Just first, are you assuming branded competition on NARCAN next year, number one? And then number two, I know you have a multi-dose product in development. What percent of patients -- overdose patients need to be redosed with NARCAN? I'm just trying to sense for the unmet need for a longer-acting type of product?

Answer – Robert G. Kramer: Doug, do you want to take that?

Answer – C. Douglas White: Sure. I'll start with the need for more than 4-milligram dose. We don't have any data or statistics to determine how many individuals required 8 milligrams instead of 4 milligrams. I think the important thing about the NARCAN Nasal Spray, the 4 milligrams, we do know that it works. The nice thing also is that you can titrate. And if you're in a hospital and since you're being put on naloxone, they titrate you up, and then (inaudible) but they don't load you with a high dose of naloxone right out of the gate. So we don't have specific numbers, but we are aware, in some cases, the first responder or loved one had to use both doses in the box. And that is the case in some situations. In fact, we hear anecdotes that when asked police officers, how many doses? They look at each other and say, well, how many policemen were on the scene because what happens is they tend to go and exhaust their

NARCAN and then the next one goes and does it just because they want them to hurry up and recover. It takes a couple of minutes, but we don't have good data, hard data on that.

The first question, I'm sorry, could you repeat the first question for me?

Question – Dana Carver Flanders: Are you assuming branded competition next year?

Answer – C. Douglas White: Yes. In our plans, we assume branded competition will enter and our models all include branded competition. In fact, before we acquired Adapt, we had anticipated branded competition, and that was built into our models as well for the valuation.

Analyst: Boris Peaker, Cowen and Company, LLC, Research Division - MD & Senior Research Analyst

Question – Boris Peaker: Boris Peaker from Cowen. Just to follow-up on the prior question, you talked about higher dose of naloxone. What are your thoughts on competition from nalmefene, whether it's injectable or intranasal in development?

Answer – C. Douglas White: So I mentioned earlier that we have a program being funded by NIDA for a long-acting nalmefene. That's not for overdose recovery, that's for treatment, to help individuals sustain once they're clean. It would be very similar to give you an analog like VIVITROL because it does last so long and we would have a longer-lasting option for that. We see that there may -- we see that there are unique applications for nalmefene, but do not believe that nalmefene will replace naloxone as the opioid overdose rescue drug. There are challenges with it, including the fact that, especially if you're recovering someone that has an opioid use disorder, that; number one, you potentially put them into withdrawal; number two, is the FDA has communicated this in public meetings that you send them out and then they start to redose themselves with opioids to get the high, if you will, or to get rid of the potential withdrawal symptoms and you risk them dying once they're released. So there's a big concern around utilization of nalmefene for opioid use overdose recovery. We are actively engaged with both the FDA and others in terms of understanding their priorities, but we don't see that being a replacement for naloxone in this market.

Analyst: Brandon Richard Folkes, Cantor Fitzgerald & Co., Research Division - Analyst

Question – Brandon Richard Folkes: Brandon Folkes from Cantor again. In your last plan, you talked about a goal for your international business. Any color around that in the 2024 plan?

Answer – Robert G. Kramer: Yes. So we haven't really called that out Brandon. So it's a good question. When we put together the 2016 through 2020 growth strategy, I think it was informed significantly on the portfolio of products that we had at that time in that medical countermeasure business. And we knew then, as we know now, that there are opportunities internationally for many of our medical countermeasure products. And most of those are being sold internationally. Now with the portfolio of products that we have today as a result of the last 4 acquisitions, it continues to be, I think, a driver of growth going forward, but not a key element, which is not to say that we're backing away from the upside in that business, but there are many other drivers of upside in both the organic business as well as through M&A that are, quite frankly, more important to us going forward for the long haul.

Analyst: James Francis Molloy, Alliance Global Partners, Research Division - MD of Equity Research and Biotechnology & Specialty Pharmaceuticals Equity Research Analyst

Question – James Francis Molloy: Jim Molloy from Alliance Global Partners. I had a couple of questions. First on the opioid sort of crisis. There are a few ways to bite the apple and the NARCAN is one of them. There's also medically assisted treatment to sort of treat folks who are addicted to opioids. Are these areas that you've looked at for potential acquisitions or development?

Answer – Robert G. Kramer: That's a good question, Jim. And our focus to date since the acquisition of NARCAN has been, as Doug indicated, on the treatment of the -- of people who are overdosing as a result of opioid use. We are working a bit along those lines that -- schedule that Doug showed in terms of the pathway and how we can potentially impact patients who are at risk because of opioids. I think we will continue to evaluate. But Doug, I don't know if there's anything else you want to add?

Answer – C. Douglas White: Yes, well, to be very blunt, I mean, our goal is to eventually move into the treatment side. You need both. I mean you have to -- people are going to overdose and you need to make sure that there's naloxone available to help them recover, in fact, they did give them the chance to go into treatment. I mentioned the NIDA grant, that long-acting nalmefene is designed for treatment, not for opioid overdose recovery. So that's currently in our plans. It's a little longer term. And as Atul mentioned, we continue to evaluate the landscape and look at opportunities again that meet the criteria that Atul highlighted.

Question – James Francis Molloy: The last question would be on the CDMO business. I generally think of that as a lower-margin business, maybe I'm thinking incorrectly on that versus the drug business? And how does that weigh into your -- I think it's 14% EBITDA target -- aspirational target. How do you sort of weigh what may be lower-margin business, but a better top line in that space?

Answer – Robert G. Kramer: Sure. So the adjusted EBITDA margin, just to be clear, is in that 27% to 30% range. I think as we have talked about on an ongoing basis, we do recognize that, that services piece of our revenue is a lower-margin business, and that's okay. It's a diversification play for us. It's a utilization of our capacity play for us. But Syed and Sean, please weigh in here on how you view that longer term.

Answer – Sean Kirk: Yes, I'll jump in. So as we mentioned during the presentation, the acquisition strategy over the years has brought these key critical products into our network and the assets that come along with them. So part of that is our commitment to preserve that capability of readiness for the U.S. government, particularly in the medical countermeasure side. But we never envisioned that these facilities would be dedicated. So to Bob's point, the government understands that we're utilizing these facilities for CDMO activities as well. So while you may view lower-margin CDMO as a bit of a drag, it's also, to Bob's point, enhanced the overall profitability profile of our internal products over time. And from a CDMO perspective, I don't know, Syed, do you want to comment, you and I were discussing earlier, this concept of CDMOs that have their own products and how we view that.

Answer – Syed T. Husain: Yes. So the piece that I would add there is when you look at the CDMO landscape, especially from a margin standpoint, you look at the offering behind it and its ability to penetrate into the market. So on one hand, within CDMO, it's a balance between our offering having services and manufacturing, and then the aspect that it's focused on biologics versus, say, traditional small molecules. So those are key variables that provided the appropriate margin profile to impact positively the overall enterprise. And then the final piece is the scalability of it. So the penetration comes into, do we have a differentiated offering or not. And here, under the concept that we are a CDMO on the offensive that takes into account that we know what our customers go through in terms of developing a product and marketing a product, we can inherently position ourselves to penetrate more of the addressable market.

Analyst: Jessica Macomber Fye, JP Morgan Chase & Co, Research Division - Analyst

Question – Jessica Macomber Fye: Jessica Fye, JPMorgan. Just going back to the 13% revenue CAGR and the relative contribution there. I think you said mid to high singles organic growth, was that a CAGR? I know you said -- kind of said there are multiple ways to get to this revenue target. But just as a base case, can we think about sort of a little more than half of that incremental $900 million of revenue coming organically and maybe half or a little less than half coming inorganically?

Answer – Robert G. Kramer: Yes. I think it's a fair way to look at it, Jess, as a base case. Again, if you apply a mid- to high single-digit CAGR rate on the organic business, you're going to get about half way there between where we are today in that $2 billion number. So I think it's fair to look at it kind of as a 50-50 split as a base case scenario. But understanding, as I said earlier, and we all have commented, there are multiple paths to getting to that $2 billion number. And just as there were multiple paths in the 2016 through 2020 period, including a path that was only organic, I think, we see that potential here as well for the 2020 through 2024. It's not as likely a scenario, but I wouldn't necessarily rule that out. Again, we continue to be because of the case that Atul made interested in M&A opportunities, again, to build upon and scale leadership positions, but there are multiple ways to get to that $2 billion number. I think he had a question in the back.

Analyst: Dana Carver Flanders, Guggenheim Securities, LLC, Research Division - Senior Analyst

Question – Dana Carver Flanders: Dana Flanders from Guggenheim. Okay. Just a question on -- and I know we're waiting for the decision on NARCAN IP with generics. How are you thinking about just some of the challenges generics may face in the event that they do get to market on penetrating the public interest component of NARCAN and specifically how NARCANDirect could play into that as well?

Answer – Robert G. Kramer: Yes. So I think it's a good observation, Dana. As we've talked about and as Doug has reiterated yet again this morning, there are 2 significantly different markets for NARCAN Nasal Spray today. There's that public interest market, where we're working directly with state and local governments to access state and federal funds to educate and to procure naloxone products. That market, I think, arguably, will be more difficult for a generic competitor or quite frankly, a branded competitor to come in and compete in. I think when you look at the retail space at the pharmacies, that's where a generic competitor, I think, would come in and have a greater success of competing with us, but that public interest market because of the work that we've done directly with these state and local governments, the brand recognition of NARCAN, I think will insulate us a bit. But Doug, if you want to add more to that, please do?

Answer – C. Douglas White: No. I agree with Bob's commentary. Generic companies are structured as generic companies. They don't have big commercial infrastructures for branded products. Not aware that they work currently

in state -- public health organizations and others. But we do think it would be a more challenge for a generic to penetrate significantly into the public interest market. But you know -- everyone knows generics in the Rx market and familiar with how that works.

Answer – Robert G. Kramer: Probably have time for one more.

Analyst: Keay Thomas Nakae, Chardan Capital Markets, LLC, Research Division - Senior Research Analyst of Therapeutics, Devices and Diagnostics

Question – Keay Thomas Nakae: Keay Nakae, Chardan. Bob, your recent acquisitions, at least on the commercial side, have forced you to kind of step-out of your comfort zone from selling products to a single federal government agency. So what are some of the challenges you've encountered in commercializing these new products? And what have you learned that will help you going forward, especially as you have laid out your aspirational goals here over the next 5 years?

Answer – Robert G. Kramer: That's a great question. So I think one of the things we've been very careful about is when we make acquisitions in markets, in channels of distribution, the classic emergent doesn't have particular expertise or history on. We've always made a point to bring that expertise and capability with us. Doug and Atul made the observation when we acquired the NARCAN Nasal Spray business from Adapt. We brought over all 40 employees of Adapt and embraced and developed and incorporated them into the Emergent enterprise because we knew exactly that point was critically important to build upon the success over the last 3 years since they launched that product in February of 2016. Similarly, with -- when we acquired the Travelers Health business from PaxVax under Abbey's leadership, we did the same thing. So we're careful. We're a bit prudent. These acquisitions that we're making in this space, these aren't necessarily huge synergy players. They are being made in a very careful, disciplined, tactful way, again, to build and scale leadership positions in these segments of the public health threat markets where we think we can compete long-term, very effective, in a very unique way. So we'll continue to learn those lessons, which is why my earlier observation about needing to be careful about building scalable capabilities long-term that will serve us well going forward.

Answer – Atul Saran: Bob, can I add to that?

Answer – Robert G. Kramer: Sure.

Answer – Atul Saran: So let me just add a little bit. As we talked about the integration piece and how we think about this, and there's 2 things in particular, I would add. One is, I think Sean mentioned this earlier, we set up our business unit structure in 2017 after we had launched our 2016 plan. And intentionally in setting up that business unit structure was this idea that strategically, we wanted to have dual market opportunities. So a core piece of that was bringing in business unit leaders that had that core expertise that was not necessarily legacy Emergent. And so you see that, particularly with the PaxVax and the Adapt acquisitions, we have both Abbey on board and we have Doug on board, both who have had long track records in the commercial space. So I think that's the first point that I'd make, and I think the BU structure is really tailored to drive that forward.

The second thing is on really bringing the integration and the cultural pieces together. I think having really strong commercial leaders in the organization, I think, has been really important to us. At lunch and I'm going to call them out here, Jeremy Gowler and Eric Karas are both here, who head up, respectively, the Travel Health commercial side and the NARCAN Nasal Spray commercial side. And I think, they're both from the legacy acquired organizations and I think are real contributors to the culture of their organization here right now and good representation of how we think about integration at Emergent.

Answer – Robert G. Kramer: All right. Mr. Burrows, do you want to wrap up here?

Answer – Robert G. Burrows: Yes. So to book in the event, ladies and gentlemen, both here in person and on the webcast, thank you for your time and attention. You've all committed a lot of time. As I've -- we -- I'm hopeful that it's been a good exchange today. As I've grown accustomed to conversations with many of you here in the room, indeed, I think this has been a very productive day.

A couple of housekeeping pieces. So for the webcast participants, we're about to close on the webcast as we conclude the formal piece. For those, all of us in the room, we are now going to transition to lunch. Those that can stay, we would love to spend the next hour with all of you as well. To Atul's very salient point, members of our additional team are here in the back of the room. They will be also participating in lunch, and let me just give you some housekeeping on lunch. So we have 8 tables. Each table will be manned by members of the presenting teams here as well as their associates, and then they will switch 3x during the next hour -- twice, I beg your pardon, over the next hour, in which case, you don't have to move, they will move, but you'll get a series of different conversations over the next hour. Again, for those that are able and willing to stay. So again, on behalf of all of the members of the Emergent's team, we thank you for your time and attention, and we are adjourned.