

Medi-Tech Insights

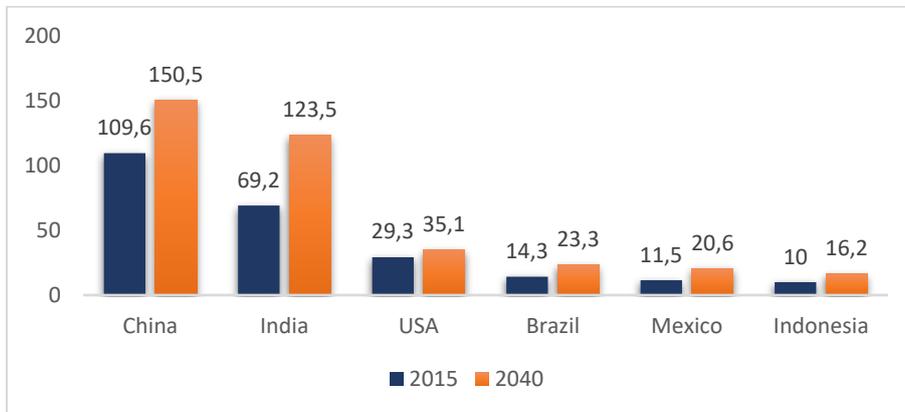
Introduction to Diabetes

Diabetes is a chronic disease that causes high blood sugar when the pancreas is no longer able to make insulin or when the body cannot utilize it efficiently. It is divided in the below mentioned categories:

- **Type 1 Diabetes:** the pancreas does not produce any insulin
- **Type 2 Diabetes:** the pancreas produces very little insulin

Out of the total global diabetic population 5-10% people have type 1 diabetes and approximately 90-95% have type 2 diabetes. As per IDF, in 2019 approximately 463 million people were living with diabetes which by 2045 will rise to 700 million with 760 billion USD in health expenditure.

Countries with Diabetes worldwide: 2015 vs 2040: (in million)



Type 1 diabetes treatment plan includes, twice-daily insulin and basal bolus regime (short & intermediate acting insulin).

Type 2 diabetes treatment plan mainly includes healthy diet, healthy body weight & increased physical activities. Insulin and oral medications such as Metformin & Sulfonylureas.

Top Market Players

Company	Insulin Pumps	CGM/Blood Glucose Monitoring	Digital/Apps	Remarks
	Yes	Yes	Yes	95 years in diabetes care
	Yes	Yes	Yes	
	No	Yes	Yes	
	Yes	Yes	Yes	Leader in CGM market
	Yes	Yes	Yes	

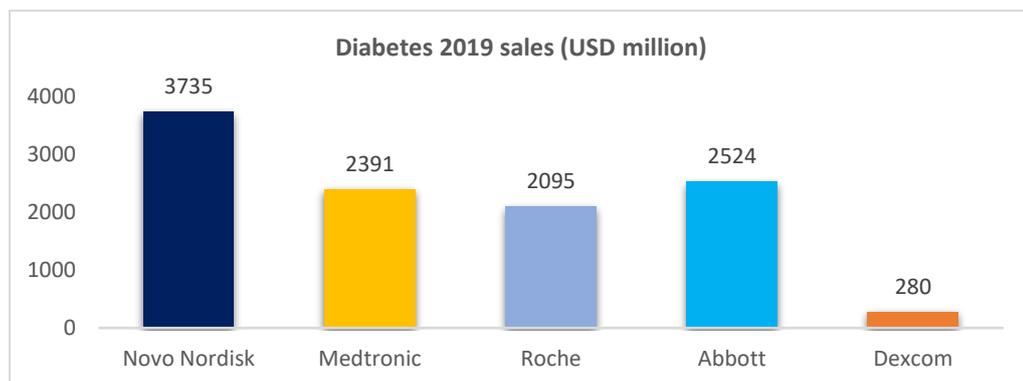
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Company	Insulin Pumps	CGM/Blood Glucose Monitoring	Digital/Apps	Remarks
	Yes	No	Yes	
	Yes	Yes	Yes	CGM in partnership with Dexcom

Market Dynamics:

- CGMs are the driving force in the overall growth of the global blood glucose monitoring devices market, which is forecast to reach US\$13bn in 2023, with a CAGR of nearly 11%.
- CGMs are expected to reach total sales of US\$9.3bn and BGMs to reach US\$3.5bn in 2023.
- According to a report by Research and Markets in 2019, global sales of automated insulin pumps are expected to increase at a CAGR of more than 12%, rising from US\$2.9 billion in 2018 to US\$5.1 billion in 2023.
- Disposable insulin pumps are expected to reach sales of US\$ 3.9 billion in 2023, up from US\$ 2.1 billion in 2016.
- European market is expected to reach US\$ 2.7 billion in 2023, up from US\$ 1.5 billion in 2016.
- Asia Pacific region is expected to be the fastest growing market with a CAGR of 8.9% from 2016-2023.

Sale of Diabetes Products 2019:



Market Drivers:

- Increasing prevalence of diabetes
- Low market penetration
- Strong demand
- Growing awareness & adoption
- Good safety, efficacy & reimbursement
- Improvement in glycaemic control/time in-range
- Technological innovation

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- Expansion of indications (e.g. to younger patients, Type 2 insulin-dependent users)
- Highly lucrative insulin sets/ disposables (pump supplies).

Competitive Landscape:

- CGM market is dominated by Abbott (Freestyle Libre). Others include Roche, Medtronic, Ascensia Diabetes Care and Dexcom.
- High-profile partnerships happened between pharma, medtech and healthtech companies in recent years: Abbott’s partnerships with Sanofi, Novo Nordisk, and Tandem Diabetes Care, among others; Nemauro Medical and Changing Health; Astellas and Welldoc; and Livongo and Dexcom.
- Insulin pumps market is dominated by four major players: Ireland’s Medtronic Plc. and US-based Tandem Diabetes Care Inc., Insulet Corp., and Valeritas Inc.

New trends and innovations:

- In April 2018, FDA authorized IDx-DR, an AI-based algorithm that solely uses machine learning to screen for diabetic retinopathy.
- New diabetes digital tools offer the potential to provide more precise information & simplify diabetes management.
- From an economic perspective studies show that using connected devices can reduce medical costs.
- Development of multi-part "artificial pancreas" device systems for Type 1 and some Type 2 diabetics — also referred to as automated insulin delivery or a hybrid closed loop system is a priority for FDA and industry.
- Google-backed Verily, meanwhile, has partnered with Dexcom to create a low-cost, miniaturized CGM for individuals with Type 2.
- Medtronic's MiniMed 670G hybrid closed loop device received FDA authorization in 2018 for use in Type 1 diabetics between the ages of seven and 13. Latest version, 780G being launched in Europe in 2020.



Company	Technology	Description
Tandem Diabetes Care	Control IQ t:sport mini-pump	<ul style="list-style-type: none"> - Most advanced commercial closed loop system available - Hybrid of t:slimX2 pump that can be used via smartphone app or as separate receiver device
Insulet Corporation	OmniPod Horizon Closed Loop pump	<ul style="list-style-type: none"> - After OmniPod DASH system in 2019 & DIY version of the loop system that is compatible with OmniPod tubeless pump, in 2020 they have plans to launch OmniPod Horizon that will have potential smartphone mobile app control

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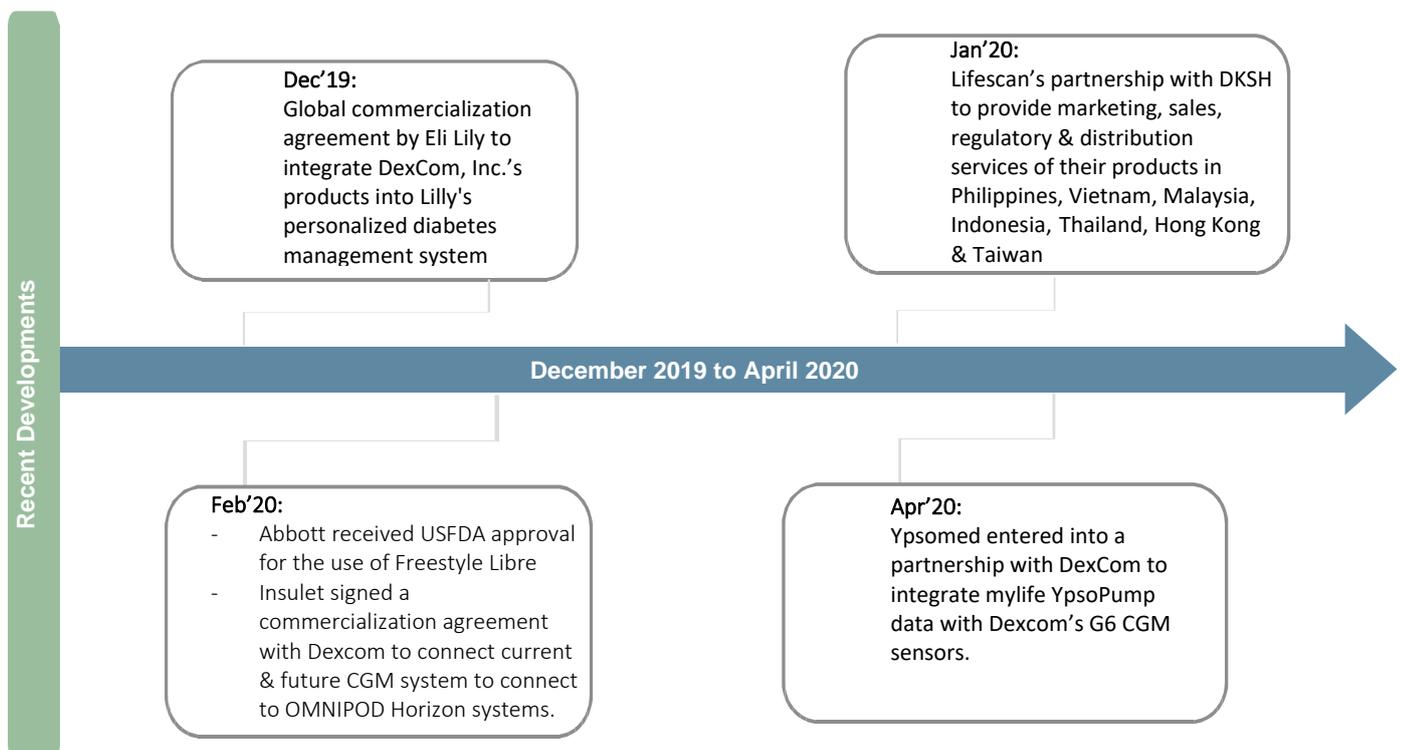
Medtronic plc	780G	<ul style="list-style-type: none"> - Advanced hybrid closed loop system with BLE - It will provide automatic correction bolusing, automatically adjust for missed meals & allow an adjustable glucose target down to 100mg/dL - Remote software updating, Bluetooth Low Energy (BLE) for data sharing - Anticipated launch by the end of 2020
Dexcom	G7 CGM System	<ul style="list-style-type: none"> - This is in collaboration with Verily - Extended wear of 14-15 days with no finger stick calibrations - Fully disposable integrated units - Thinnest CGM sensors released till date - Expected commercial launch by 2021
MannKind Corp.	Afrezza using Bluetooth connectivity	<ul style="list-style-type: none"> - Afrezza is the only rapid action insulin that can be inhaled - BlueHale Pro launched for healthcare providers in 2020
Xeris Pharmaceuticals	Gvoke HypoPen	<ul style="list-style-type: none"> - Self- contained & for quick one time use & disposal - The pen auto-retracts & locks making it impossible to reuse. - Expected launch: July 2020
Eli Lilly & Company	Ultra-Rapid Lispro Insulin (URLi) New Hybrid Patch Pump	<ul style="list-style-type: none"> - Faster acting meal-time insulin. Expecting to receive FDA approvals in Japan, EU & USA - In development hybrid closed-loop systems
Beta Bionics	iLet Bioinic Pancreas System	<ul style="list-style-type: none"> - Pocket-sized, wearable, investigational medical device designed to control blood-sugar levels - Three-in-one medical device. It can be configured as insulin/glucagon only or bi-hormonal bionic pancreas - Insulin-only part anticipated to release in 2020 - Glucagon and bi-hormonal to follow
WaveForm Technologies	Cascade CGM system	<ul style="list-style-type: none"> - Real time glucose data provided through predictive & customized alerts, informative glucose trends - Received CE mark in November 2019 & US commercialization anticipated in 2021

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Digitization of Diabetes:

- Innovative payers, providers and employers are offering programmes (e.g. web-based interventions, mobile apps, telephone support, interactive games, and real-time monitoring) to members and patients.
- More than 900,000 mobile apps available in the Apple App Store and more than 700,000 apps in the Google Play Store.
- DRG (Decision Resource Group) Digital conducted a survey in 2018 and found out that insulin manufacturers Novo Nordisk and Sanofi deliver the best online experiences for patients with Type 2 diabetes.
- Novo Nordisk launched NovoPen 6 and NovoPen Echo Plus in 2019 to synchronise dosing data with digital platforms developed by companies such as Dexcom, Glooko, Roche, Abbott, Medtronic & others.

Recent Developments:



Growth Opportunities for Companies & Investors:

- Continued growth in diabetes incidence & prevalence leading to growth in insulin delivery, CGM/blood glucose monitoring devices & digital applications market
- Increase in penetration of new technologies like insulin pumps, closed loop systems & digital applications managing care & helping improve patient compliance
- Carve-outs from large global companies & accelerated growth opportunities for independent private companies offer strategic investment opportunities