

**EGYPTIAN PHARMACOECONOMIC UNIT**  
**CENTRAL ADMINISTRATION FOR PHARMACEUTICAL AFFAIRS**

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**MINISTRY OF HEALTH**

**WHERE ARE WE NOW?  
WHERE ARE WE GOING?**

**COST EFFECTIVENESS ANALYSIS**

of INSULIN DEGLUDEC/ ASPART Versus INSULIN DETEMIR In Egyptian Patients of Type 1 Diabetes.

**COST EFFECTIVENESS ANALYSIS**

of INSULIN DEGLUDEC/ ASPART versus BIPHASIC INSULIN ASPART 30 in Egyptian patients of type 2 diabetes.

**COST-EFFECTIVENESS ANALYSIS**

of INSULIN DEGLUDEC compared with INSULIN GLARGINE for patients with type 1 diabetes .

**COST-EFFECTIVENESS ANALYSIS**

OF INSULIN DEGLUDEC compared with INSULIN GLARGINE for insulin naïve patients with type 2 diabetes.



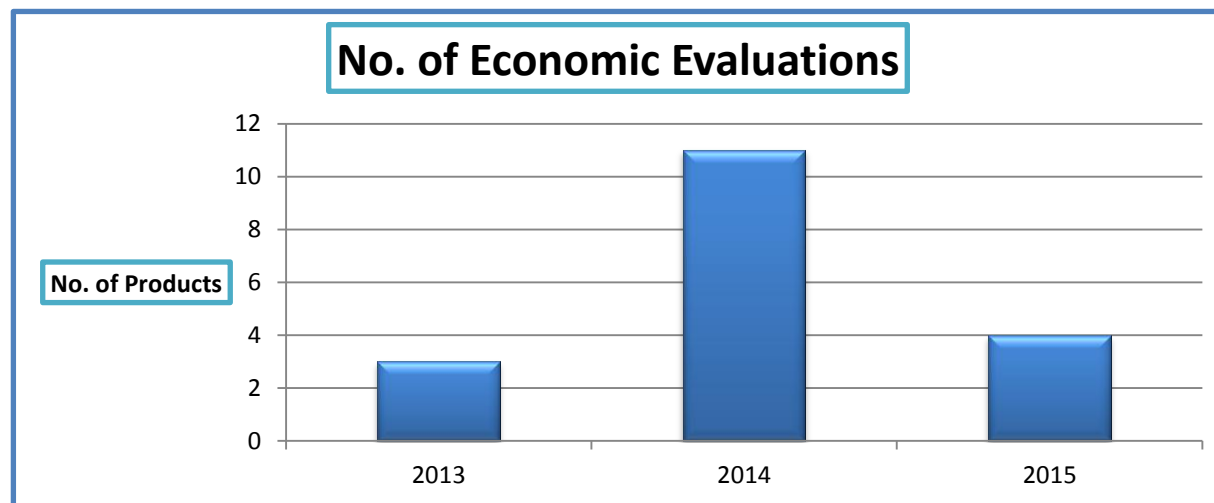
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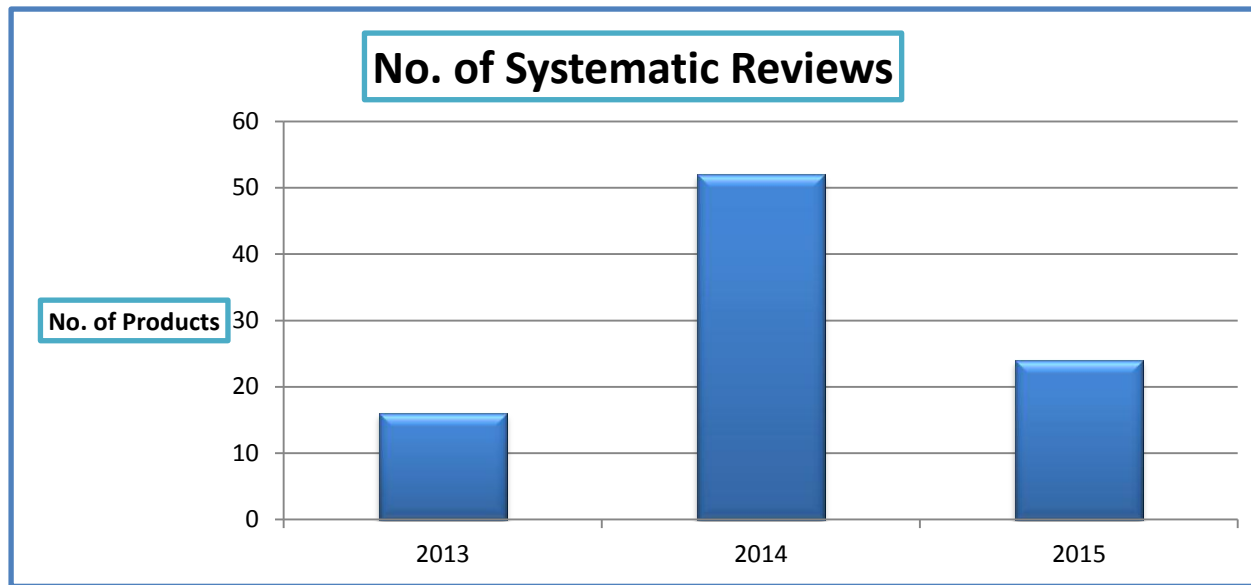
## WHERE ARE WE NOW? WHERE ARE WE GOING?

The Pharmacoeconomic Unit has been established in August 2013 with a well-defined vision of providing **scientific guidance of the value of drugs** in delivering expected outcomes to decision makers, health professionals and the public while the mission is to **evaluate economic studies** of both new and existing pharmaceutical products and medical devices, **conduct economic studies for products** selected in Tender List, Essential Medicine List and Hospital Formulary and **provide education and training programs** to build capacities in this field.

Since that we started to evaluate products recommended by decision makers to assist them in choosing the most cost effective treatment options. We are delighted to present our annual reports from **August 2013 till July 2015**.



**Snapshot on total # of economic evaluations conducted over the 1st 2 years**



### Snapshot on total # of systemic reviews conducted over the 1st 2 years

Over the previous 2 Years we are committed to guide both Pricing and Tenders committees to make informed decisions regarding mandatory and reimbursement pricing respectively.

Now, we are resuming our mission by building more capacities in hospitals by launching training programs, targeting decision makers. These programs will provide them with theoretical principles and practical real case studies to enable them realize the importance of Pharmacoeconomics and health technology assessment to make informed decisions.

## Cost Effectiveness Analysis Of Insulin Degludec/ Aspart Versus Insulin Detemir In Egyptian Patients of Type 1 Diabetes

Asmaa Saad<sup>1</sup>, Gihan H.EISisi<sup>1</sup>

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### Objective:

Insulin degludec/insulin aspart (IDegAsp) is a soluble co-formulation of the novel basal analog insulin degludec (IDeg: 70%) and insulin aspart (IAsp: 30%). The aim of this study is to assess the cost effectiveness of a co-formulation of IDegAsp compared with basal-bolus therapy using insulin detemir (IDet) in patients with type 1 diabetes over one year.

### Methods:

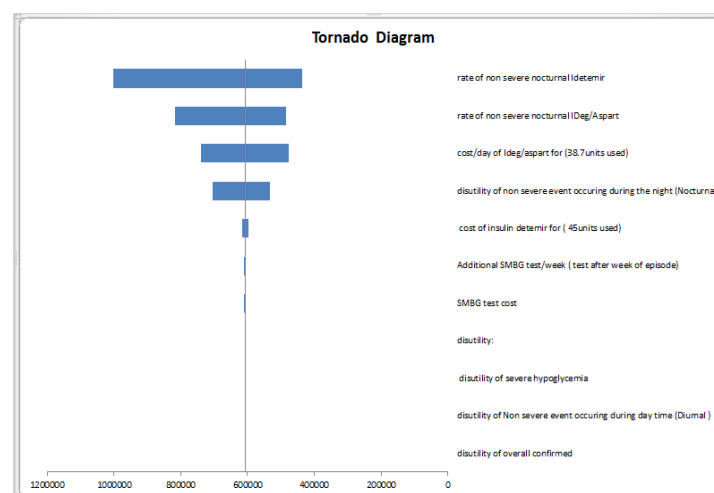
An economic model was used based on measuring event rate of hypoglycemic episodes per one year (classified as daytime, nocturnal or sever). Event rate of hypoglycemic episodes are derived from a previously published randomized clinical trial, the direct medical costs of the three types of episodes were derived from the national institute for diabetes and endocrinology, utility values were derived from literature to estimate QALY gain. Direct medical costs were based on drug regimen, Self Monitoring Blood Glucose test and management of hypoglycemic episodes costs. No discounting was used due to its short time horizon. All costs were reported in Egyptian pounds of the financial year 2015. One way Sensitivity analysis was conducted to find the impact of altering the base case value of input parameters on the results.

### Results:

The total quality adjusted life years (QALY) of IDegAsp was greater (0.981) than IDet (0.961). Total costs of IDet (EGP 917) were less than IDegAsp (EGP 12740). The incremental cost effectiveness ratio (ICER) was estimated at EGP 607298 per QALY gained. Sensitivity analysis showed that the rate of non severe nocturnal hypoglycemic episodes of IDet has the greatest impact on the results .

### Conclusion:

IDegAsp is not cost effective compared to the IDet at ICER of 607,298 which is above the threshold stated by world health organization for low and middle income countries.



**Fig. 1 : One way sensitivity analysis**

## Cost effectiveness analysis of insulin degludec/ aspart versus Biphasic insulin aspart 30 in Egyptian patients of type 2 diabetes.

Asmaa Saad<sup>1</sup> , Gihan H.EISisi<sup>1</sup>

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### Objective:

Insulin degludec/insulin aspart (IDegAsp) is the first combination of basal insulin with an ultra long duration of action, and rapid-acting insulin in a single injection. The aim of this study is to assess the cost effectiveness of a co-formulation of IDegAsp compared with basal-bolus therapy using bi phasic insulin aspart ( BIAspart 30) in patients with type 2 diabetes.

### Methods:

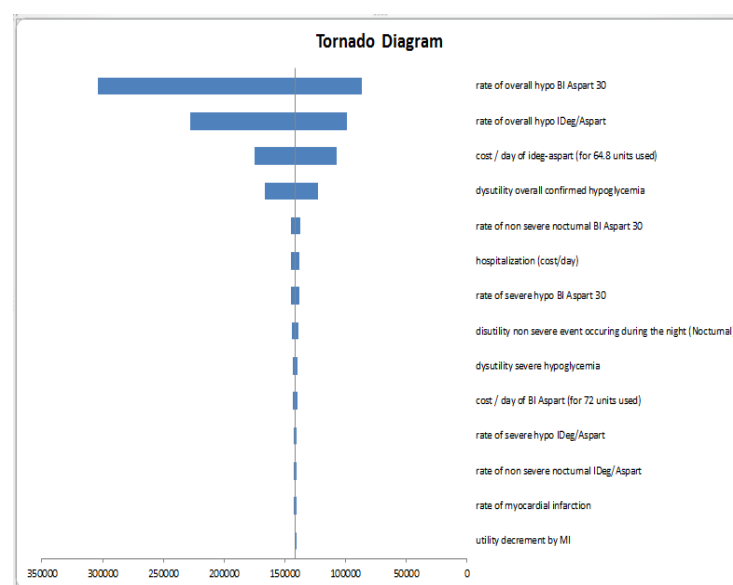
An economic model over one year was used based on measuring event rate of hypoglycemic episodes per one year (classified as daytime, nocturnal or sever). Event rate of hypoglycemic episodes were derived from a previously published randomized clinical trial , direct medical costs of the three types of episodes were derived from the national institute for diabetes and endocrinology , utility values were derived from literature to estimate the QALY gain. Direct medical costs were based on drug regimen , Self monitoring blood glucose test , management of hypoglycemic episodes and side effects treatment costs . No discounting was done due to its short time horizon . All costs were reported in Egyptian pounds of the financial year 2015. One way Sensitivity analysis was conducted to find the impact of altering the base case value of input parameters on the results.

### Results:

The total quality adjusted life years (QALY) of IDegAsp was greater (0.777 ) than BIAspart30 ( 0.652). Total costs of BIAspart 30 (EGP 8543) were less than IDegAsp ( EGP 26297), the incremental cost effectiveness ratio was estimated at EGP 141155 per QALY gained . Sensitivity analysis showed that the rate of overall confirmed hypoglycemic episodes of BIAspart 30 has the greatest impact on the results.

### Conclusion:

IDegAsp is not cost effective compared to the BIAspart 30 at ICER of EGP 141155 per QALY gained as it is above the threshold stated by world health organization for low and middle income countries.



**Fig. 1 : One way sensitivity analysis**

## Cost-effectiveness analysis of insulin degludec compared with insulin glargine for patients with type 1 diabetes treated with basal bolus insulin regimen

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<sup>1</sup> Pharmacoeconomic Unit, Central Administration for Pharmaceutical Affairs, Ministry of Health, Egypt

### Background :

Insulin degludec is a long-acting human insulin analogue for once daily subcutaneous administration. The glycemic control achieved with insulin degludec is comparable to that observed with insulin glargine in type 1 and type 2 diabetes. However, Hypoglycemia is the limiting factor in the glycemic management of diabetes.

### Objective :

Assess cost effectiveness of using insulin degludec compared to insulin glargine as basal insulin in adults with type 1 Diabetes Mellitus in a basal bolus regimen.

### Methods:

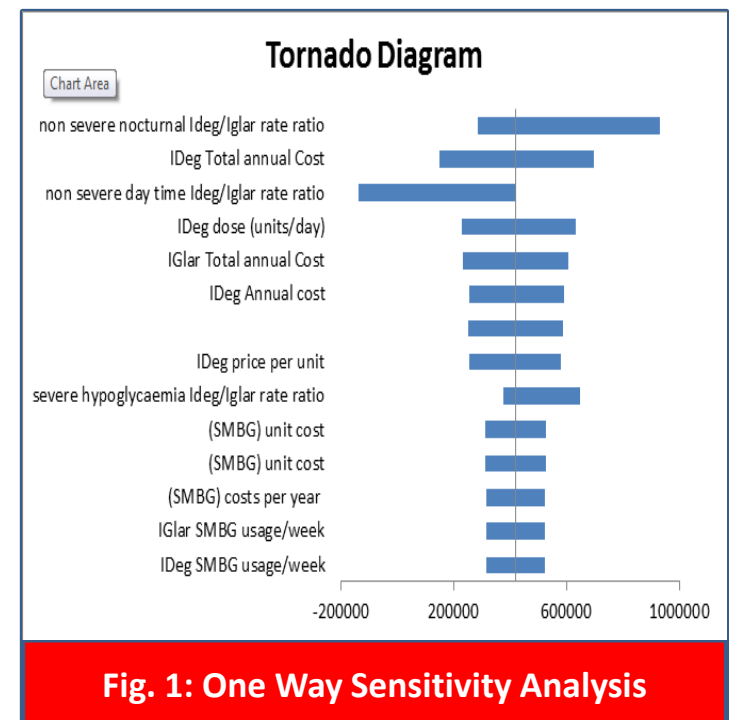
An economic model over 1 year was conducted using hypoglycemic events rates, derived from meta-analysis of phase 3 clinical trials. Hypoglycemic events are classified into severe, non-severe nocturnal and non-severe day time events. Direct medical costs of the therapy, management of hypoglycemia events and self-monitoring blood glucose (SMBG) were included. Quality-adjusted life-years (QALY) were calculated by using disutility associated per hypoglycaemic event to the baseline utility for IDeg and IGlar in addition to utility applied to Insulin Degludec for flexible dosing. One way sensitivity analysis was conducted to examine the effect of changes in individual base case parameters across possible ranges of values.

### Results:

Using insulin Degludec as basal insulin in type 1 diabetes mellitus cause additional cost of EGP 6,034 with an expected gain of 0.014 QALY. Base case incremental cost effectiveness ratios (ICERs) were estimated at EGP 423936.8 per QALY. Sensitivity analyses showed that non severe nocturnal rate ratio has the major impact on the results.

### Conclusions:

Insulin Degludec is not a cost-effective treatment option versus Insulin Glargine in patients with Type 1 DM using basal bolus insulin according to the societal willingness-to-pay threshold limit (3x GDP/Capita).



## Cost-effectiveness analysis of insulin degludec compared with insulin glargine for insulin naïve patients with type 2 diabetes.

Esraa Saeed<sup>1</sup>, Gihan H. ElSisi<sup>1</sup>

<sup>1</sup> Pharmacoeconomic Unit, Central Administration for Pharmaceutical Affairs, Ministry of Health, Egypt

### Background:

Insulin degludec is a long-acting human insulin analogue for once daily subcutaneous administration. The glycaemic control achieved with insulin degludec is comparable to that observed with insulin glargine in type 1 and type 2 diabetes. Hypoglycemia is the limiting factor in the glycaemic management of diabetes.

### Objective:

Assess cost effectiveness of using insulin degludec compared to insulin glargine as treatment regimen in insulin naïve adults patients with type 2 Diabetes Mellitus.

### Methods:

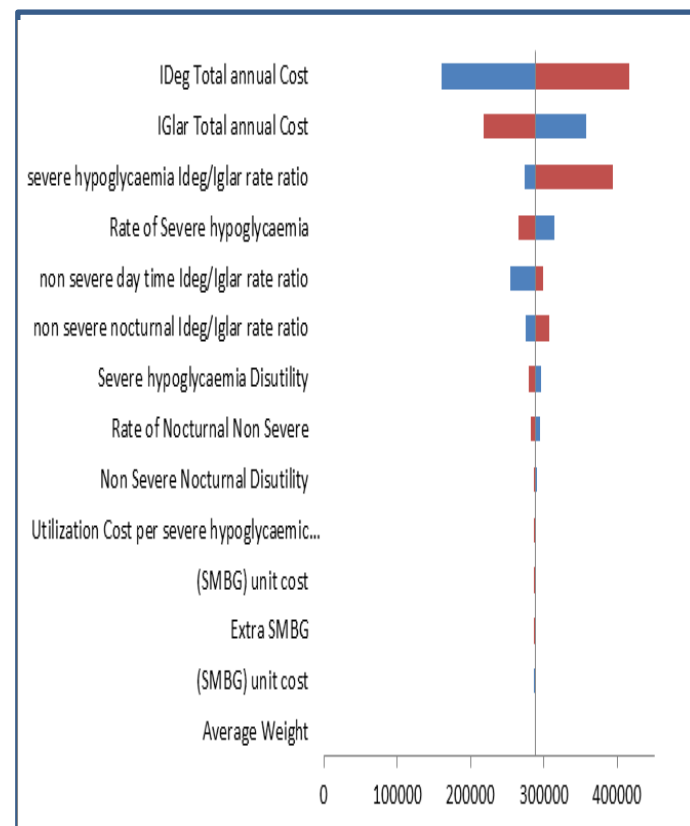
An economic model over 1 year was conducted using hypoglycemic events rates derived from meta-analysis of phase 3 clinical trials. Hypoglycemia events are classified into severe, non-severe nocturnal and non-severe day time events. Direct medical costs of the therapy, management of hypoglycemia events and self-monitoring blood glucose (SMBG) were included. Quality-adjusted life-years were calculated by using disutility associated per hypoglycaemic event to the baseline utility for IDeg and IGlar in addition to utility applied to Insulin Degludec for flexible dosing. One way sensitivity analysis was conducted to examine the effect of changes in individual base case parameters across possible ranges of values.

### Results:

Using insulin Degludec in type 2 diabetes mellitus cause additional cost of EGP 3,481 with an expected health gain of 0.012 quality adjusted life years. Base case incremental cost effectiveness ratio (ICER) was estimated at EGP 287952 per QALY gained. Sensitivity analyses showed that insulin degludec total annual cost has the major impact on the results.

### Conclusions:

Insulin Degludec is not a cost-effective treatment option versus Insulin Glargine in patients with Type 2 DM using basal bolus insulin according to the societal willingness-to-pay threshold limit (3x GDP/Capita).



**Fig. 1: One Way Sensitivity Analysis**



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