Access to insulin in developing countries needs to be increased

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The paper by Majaliwa and colleagues (summarised to the right) could not contrast more strikingly with that by the DirecNet Study Group (see below) – two ends of a very broad spectrum.

One group from Tampa, Florida, reports on children and adolescents with type 1 diabetes using pumps and continuous glucose monitoring where the mean HbA_{1c} at the start of the trial was 7.1±0.6 %. The other group, from the leading teaching hospital in Tanzania, East Africa, found that the mean HbA_{1c} of a similar age group was 10.65±2.1 %. Only one child in the Tanzania-based study had an HbA_{1c} below 7.5 % and almost a quarter had an HbA_{1c} >12.5 %. The Tanzanian group found retinopathy in 22 % and microalbuminuria in 29 %, even though the average age was only 12.6±3.5 years.

Why such terrible results? – Well, read on: insulin was not always available for 42 % of the Tanzanian children and none had a glucose meter or strips for testing their blood glucose levels. Sadly, this lack of life-saving insulin (let alone monitoring equipment) is common across the developing world. According to the IDF 65 % of the global population with diabetes live in developing countries but account for only 30 % of the world's total insulin usage each year. The industrialised world contains 35 % of the world's population with diabetes, yet accounts for about 70 % of the world's total insulin usage each year.

The consequences in some parts of Africa are that many people with type 1 diabetes under the age of 15 can expect to live for just 1 year after diagnosis (Makame, 1992).

What is being done to change things? The IDF has a *Task Force on Insulin, Test Strips and Other Diabetes Supplies* and has partnerships with Insulin for Life Australia, the Rotary International Foundation – who have a Child Sponsorship Program in Bolivia – and the International Insulin Foundation – a non-profit organisation working in many countries around the world to seek ways of improving access to insulin, among other important aspects of diabetes care (www.access2insulin.org).

For more information on the tragedy of type 1 diabetes across the world, read Edwin Gale's editorial from 2005; it is obviously still relevant today.

Makame MH (1992) Childhood diabetes, insulin, and Africa. DERI (Diabetes Epidemiology Research International) Study Group. *Diabetic Medicine* **9**: 571–3

Gale EAM (2005) Type 1 diabetes in the young: the harvest of sorrow goes on. *Diabetologia* **48**: 1435–8

JOURNAL OF PEDIATRICS

Continuous glucose monitoring is feasible in type 1 diabetes

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓✓

1 The feasibility of daily use of a continuous glucose monitor in children with type 1 diabetes was investigated in this US-based study.

2 Of 33 individuals aged between 4 and 17 years, three did not complete the initial phase (4–7 days). Following this run-in period to determine a baseline level of glycaemic control, the individuals were asked to use the monitor for 13 weeks.

3 On average, the monitor was used for 149 hours/week during the first 4 weeks which eventually declined to 134 hours/week in weeks 9–13.

4 The mean HbA_{1c} was significantly reduced from 7.1 % at baseline to 6.8 % at week 13 (P=0.02). The percentage of blood glucose values of 71–180 mg/dl increased from 52 % to 60 % (P=0.01)

5 Users and their guardians were satisfied with the monitor. However, two individuals had severe skin reactions due to the adhesive of the sensor mount.

6 The results indicate that continuous glucose monitoring could be incorporated into the daily treatment of children with type 1 diabetes.

Diabetes Research in Children Network (DirecNet) Study Group, Buckingham B, Beck RW et al (2007) Continuous glucose monitoring in children with type 1 diabetes. *Journal of Pediatrics* **151**: 388–93

DIABETES CARE

Care of Tanzanian children with type 1 diabetes must improve

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓✓

1 The authors of this Tanzania-based study set out to evaluate glycaemic control and complications in children and adolescents with type 1 diabetes.

2 Included in this study were 99 young people aged between 5 and 18 years attending a hospital clinic in Tanzania, East Africa.

3 These individuals or their parents/guardians completed a structured questionnaire in order to provide information about the prevalence of acute complications, including retinopathy and nephropathy.

4 All managed their diabetes using a conventional insulin regimen and the mean duration of diabetes was 4.76±3.58 years.

5 The results of the questionnaire revealed that only one child had an HbA_{1c}<7.5 %. Sixty had an HbA_{1c} between 7.5 and 10 %, 14 had an HbA_{1c} between 10 and 12.5 % and 24 had an HbA_{1c}>12.5 %.

6 Also noted was that 75% of the young people had DKA on diagnosis of type 1 diabetes, 29 children had microalbuminuria and 22 had retinopathy. Sixty-three per cent of the study group missed insulin doses due to a lack of funds or availability of insulin.

7 The authors conclude that, despite some methodological limitations, the results indicate that scarcity, poverty and inadequate healthcare increase the incidence of complications in children with type 1 diabetes in Tanzania.

Majaliwa ES, Munubhi E, Ramaiya K et al (2007) Survey on acute and chronic complications in children and adolescents with type 1 diabetes at Muhimbili National Hospital in Dar es Salaam, Tanzania. *Diabetes Care* **30**: 2187–92

JOURNAL OF DIABETES AND ITS COMPLICATIONS

Most children in the IDF Western Pacific region do not have adequate glycaemic control

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓✓

1 In this investigation the authors aimed to identify the factors associated with glycaemic control and hypoglycaemia in young people with type 1 diabetes from the IDF Western Pacific region.

2 A cross-sectional clinic-based study was undertaken in 96 diabetes centres across the IDF Western Pacific region, enrolling 2312 individuals <18 years of age.

3 Blood samples were obtained in order to determine HbA_{1c}, and clinical and management details were recorded.

4 The median age of the population was 12.5 years, median diabetes duration was 4.4 years and median HbA_{1c} was 8.3%.

5 Diabetes was managed by twice-daily injections of insulin by 61% of the population and 96% used self-monitoring of blood glucose (SMBG).

6 Higher HbA_{1c} was associated with country (for example, in Australia the mean HbA_{1c} was 7.8±1.2 % versus 10.4±2.3 % in Malaysia) as well as less frequent SMBG (P=0.02). This association may suggest that those in countries who cannot afford more frequent testing are likely to have poorer control. Higher HbA_{1c} was also significantly influenced by age, diabetes duration, sex, insulin dose per kg and insulin regimen.

7 The authors of the paper conclude that there are inequalities in care across the IDF Western Pacific Region, and that most children in this area are at higher risk of microvascular complications due to inadequate glycaemic control.

Craig ME, Jones TW, Silink M, Ping YJ (2007) Diabetes care, glycemic control, and complications in children with type 1 diabetes from Asia and the Western Pacific Region. *Journal of Diabetes and its Complications* **21**: 280–7

DIABETOLOGIA

10-s pre-exercise sprint prevents a fall in post-exercise glycaemia

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 This study investigated whether or not a 10-s maximal effort sprint performed prior to moderate exercise counters the post-exercise fall in glycaemia observed in people with type 1 diabetes.

2 Following their usual morning insulin injection and breakfast, seven males with type 1 diabetes and no complications performed either a maximal effort 10-s sprint or rested (controls) and when their postprandial blood glucose level fell to 11mmol/l they cycled for 20 minutes at 40% peak O_2 consumption.

3 The fall in post-exercise glycaemia during moderate exercise was not affected by sprinting. However, during the recovery period, blood glucose levels decreased significantly in the control group (P=0.04) while remaining stable in the sprinting group.

4 The authors conclude that performing a 10-s sprint prior to moderate exercise prevents a fall in glycaemia during post-exercise recovery.

Bussau VA, Ferreira LD, Jones TW, Fournier PA (2007) A 10-s sprint performed prior to moderate-intensity exercise prevents early post-exercise fall in glycaemia in individuals with type 1 diabetes. *Diabetologia* **50**: 1815–8

DIABETES TECHNOLOGY & THERAPEUTICS

CSII is beneficial in paediatric diabetes

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 The authors of this study retrospectively reviewed the charts of 291 individuals with type 1 diabetes who were initiated on CSII therapy at a paediatric centre in the US.

2 The mean duration of CSII therapy was 3.7±1.9 years and mean HbA_{1c} at baseline was 8.7±1.0 %. Severe hypoglycaemic events occurred at a rate of 9.06 events per 100 patient-years at baseline and incidence of DKA was 1.39 events per 100 patient-years.

3 The data from one year later were then compared with baseline. From baseline, HbA_{1c} was to 8.3±1.3 % (P<0.0001).

4 The number of severe hypoglycaemic events decreased to 7.96 per 100 patient-years, however, the incidence of DKA had increased to 3.98 events per 100 patient-years.

5 Based on these results, the authors conclude that the long-term use of CSII in young people with diabetes is beneficial.

Scrimgeour L, Cobry E, McFann K et al (2007) Improved glycemic control after long-term insulin pump use in pediatric patients with type 1 diabetes. *Diabetes Technology & Therapeutics* **9**: 421–8