How small changes led to big profits for insulin manufacturers

In the first of a series of investigations by the BMJ and Channel 4 News, Deborah Cohen and Philip Carter discover why more expensive analogue insulins are increasingly prescribed instead of cheaper human insulin despite lack of evidence of benefit for patients with type 2 diabetes

Diabetes is a market worth fighting for—it’s the fourth biggest global therapeutic class, generating total sales in 2009 of $30.4bn (£19bn; €23bn). In the UK alone, diabetes is estimated to cost the NHS some £9bn—about 10% of its entire budget.

In May 2010, Sanofi-aventis briefed investors in London on the emerging opportunity. The company stated that diabetes remains one of the largest growth opportunities in healthcare and one of the fastest growing markets—outstripping growth in the wider drug market by 5% a year for the past six years. It was, said the company, destined to grow to £60bn by 2015. Sanofi laid out the scale of its ambitions clearly: to be the number one firm in the diabetes market.

The growth in diabetes drug revenue has been caused in part by rising numbers of people with diabetes; partly by more aggressive approaches to glucose lowering; but mainly by increasing unit costs for insulin—a cost that can be attributed to the use of more expensive recombinant insulin analogues.

Sanofi’s ambition to be, in effect, the dominant force means wresting control from the traditional heavyweights of the insulin world, Novo Nordisk and Eli Lilly. However, health services and individuals across the world are paying the price for this market drive, which has seen more expensive analogue insulins taking the place of cheaper human insulin.

Added value?

Insulin comes in different forms: short acting, basal (intermediate and long acting), and a mixture of the two types called biphasic insulin. Each of these types also comes in animal, human, and analogue forms, with their own price differentials. Analogue insulins are molecularly tweaked to make rapid acting versions act more rapidly and long acting ones deliver insulin to the body more slowly than conventional human insulins. Analogue insulins have already taken the market by storm. In the UK, analogues now account for some 80% of insulin prescription items. But where the battle for market share has really been contested is in the basal insulin market. This is the form that people with type 2 diabetes are given if oral antidiabetic control is not working. Currently, two analogues compete: Novo Nordisk’s insulin detemir (Levemir) and Sanofi’s insulin glargine (Lantus).

The basal market accounts for 44% of all insulin use, rising from 37% in 2005. Insulin glargine now accounts for 66% of the global basal market, with the balance split equally at 17% between detemir and the older and cheaper isophane insulin—which has seen its share fall from 41% of the basal market in 2005.

But this boom does not seem to be supported by the scientific literature. A raft of meta-analyses, systematic reviews, and other papers come to some strikingly consistent conclusions. For most people with type 2 diabetes the extra cost does not correspond to the equivalent extra benefit. In the UK, a defined daily dose of insulin—the assumed maintenance dose in adults—costs over twice as much for the insulin analogues than for isophane insulin.

It is something that concerns the World Health Organization. An unpublished position paper on global access to insulin, written by Hans Hogerzeil, director of WHO’s Essential Medicines and Pharmaceutical Policies, at the behest of director general, Margaret Chan, states: “The global insulin market is dominated by two giant companies who are pushing a new type of insulin analogue at 3-5x the cost of human insulin, while its marginal cost-effectiveness is not fully established.”

In the UK the view is clear. A health technology assessment earlier this year concluded that in type 2 diabetes, analogue insulins weren’t worth what the NHS was being charged in most cases.

A health economic analysis in the National Institute for Health and Clinical Excellence (NICE) guidance found the cost effectiveness of long acting insulin analogues was not favourable. The incremental cost per quality adjusted life year (compared with conventional insulin) was more than £100 000 in all scenarios, and in some cases in excess of £400 000.

These findings were echoed by other health care organisations. A Canadian health technology assessment has also concluded that the newer, insulin analogues offer little clinical advantage over older, conventional insulins in terms of glycaemic control or reduced hypoglycaemia for the management of patients with type 1, type 2, or gestational diabetes. And in 2006, the German Institute for Quality and Economic Efficiency in Health Care (IQWIG),
assessed analogue insulins. It concluded that analogues would not be reimbursable as their cost effectiveness was unproved.

“The result of this report was that insulin analogues have not shown superiority over human insulin; hence no higher price is justifiable,” says Peter Sawicki, former head of IQWIG. The price of short acting insulin analogues for type 2 diabetic patients in the German healthcare system was subsequently reduced.

Meanwhile NICE guidelines recommend use of human insulin as first choice, with insulin analogues to be considered in certain circumstances. And yet somehow the analogues have shrugged off this body of evidence and their sales continue to climb rapidly. Amanda Adler, chair of the NICE guidance committee, says, “I would estimate that around 90% of people with type 2 diabetes would probably do quite well on these human insulins compared with the long acting insulin analogues.” Of these, she says, two thirds would remain on human insulin. Figures from the University of Cardiff collated for the BMJ and Channel 4 News suggest that if only 50% of those using analogue insulins had been put on human insulin instead the NHS would have saved close to £250m in the cost of insulin over the past five years.

A spokesperson for the Department of Health said: “We would expect clinicians to take into account NICE’s clinical guidelines on type 2 diabetes when prescribing decisions are made.

“The National Prescribing Centre published advice in the summer on 15 key areas of medicines use that local NHS organisations should scrutinise in taking forward work on quality, innovation, improvement, and productivity (QIPP). This specifically drew attention to NICE’s guidance about targeting of long acting insulins and the need for doctors to assess the underlying causes of poor blood sugar control before considering whether to prescribe these newer, more expensive insulins.”

But it’s not just in the UK that these analogues have taken hold. According to Novo Nordisk, analogues now account for about 70% of insulin use in the United States and 60% in Europe.

**Reasons for success**

So given the evidence and the costs, why are analogues so popular? According to Nick Freeman, an epidemiologist from Birmingham University, the demand seems to have come from patients and doctors. Indeed, Aventis didn’t realise what an important product they had. “I believe it to be related to the once a day dosage, which can be conducted in the privacy of the patient’s own home, and the perceived relative safety. Certainly Aventis underestimated it, having to put off launch in some countries because of higher than expected initial demand. Since launch, of course Aventis (now Sanofi-Aventis) has vigorously promoted the product, but it has always been seen to be useful by many physicians,” he said.

Dr Adler suggests that this market share is largely down to clever marketing. During the production of the NICE guideline on type 2 diabetes, Norman Waugh, professor of public health at Aberdeen University, and other members of the NICE team asked general practitioners why there had been such a big shift to the long acting analogues. There were several reasons given, he said. There is a notion that insulin glargine—the first analogue—with a once daily injection made it easier to switch people in whom oral treatment was not working, on to insulin. “But isophane insulin can be used once daily in type 2 diabetes mellitus,” he said. There was also a “belief that hypoglycaemia was less common—true but the difference is less than was hoped,” he added.

Indeed, one funded five year randomised trial by Sanofi-Aventis—the longest conducted on glargine—showed a smaller drop in haemoglobin A1c in patients using glargine than in those using isophane insulin (mean change from baseline −0.55% v −0.76%; mean difference 0.21, 95% confidence interval 0.06 to 0.35). And a Sanofi-Aventis funded and coauthored meta-analysis published this year suggests that severe hypoglycaemia was seen in 1.2% of patients using glargine compared with 1.1% using isophane insulin.

“The only real differences seen were in nocturnal hypoglycaemia within the first six months of therapy,” Edwin Gale, a Bristol University diabetologist and editor of Diabetologica, said. Yet it is this aspect that the conclusion in the abstract emphasised.

“This meta-analysis of open label studies provides confidence that reductions of around 50% of risk for nocturnal hypoglycaemia can be achieved with using glargine instead of NPH [isophane insulin],” it said. However, according to Professor Gale: “Such episodes are usually easily avoidable with simple clinical management without change of insulin.”

Indeed, a National Prescribing Centre document recommends that any decision to start an insulin analogue needs to be balanced carefully against the lack of long term safety data and increased prescribing costs. “People with glycaemic control problems should be properly assessed for underlying causes before these newer, more expensive insulins are considered. This includes education and checking understanding around how to manage their disease and treatment,” it said.

Some of the claims about basal analogues have caught the eye of the regulators too. In October this year, claims made in advertisements for insulin detemir were challenged in the European Court of Justice. The case was brought by the Estonian medicines regulator, Ravimiamet, which questioned three claims made in an advert in the medical journal Lege Artis.

These were that detemir offered effective control of blood sugar with a low risk of hypoglycaemia; 68% of patients who took the drug did not gain, but rather lost weight; and 82% of patients in clinical studies injected once a day. Ravimiamet argued that the claims were not borne out by the summary of product characteristics—how
Patients are often given a choice about which pen they like best—and this provides another area for market manipulation.

A decade ago, Sanofi’s currently stated ambition to be the number one business in the insulin market is unlikely to have rattled the traditional dominant players—Eli Lilly and Novo Nordisk.

But the development of the recombinant insulin analogue C267H408N72O77S6 changed everything. Originally developed by Novo Nordisk, it was abandoned because it caused localised reactions at the injection site. But the technology was picked up by Hoechst and then fell into the hands of Aventis (later Sanofi-aventis) after its acquisition of the German company. The compound eventually emerged on to the market as Lantus (insulin glargine), first in Germany in 2000.

Today Lantus is the number one diabetes brand in the world with sales well over €3bn in the past year. More importantly, according to Sanofi, glargine has changed the way diabetes is managed, leading to the “treatment paradigm shift towards basal insulin.”

How Sanofi-aventis took on the competition

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In the UK, much diabetes care is general practice based and delegated to nurses, who make the decisions about the type of insulin and injection device. At the time Sanofi was rolling out insulin glargine in the early 2000s, the primary care sector for diabetes was hugely overloaded. It was a fraught period for GPs and practice nurses with limited skills in starting patients on insulin. There were backlogs of patients who needed to be started on insulin.

Sanofi seized on the opportunity, producing a marketing masterstroke to support insulin uptake and, by extension at least, the adoption of insulin glargine in the UK. The company funded specialist diabetes nurses to train primary care staff in managing diabetes and insulin initiation. It worked with Warwick University to create a training scheme for health professionals working in diabetes care. The scheme was branded Insulin for Life. Although the training was not dependent on doctors prescribing insulin glargine, according to Martin Hadley-Brown, chair of the Primary Care Diabetes Society, healthcare professionals became familiar with it and many patients would end up using glargine as a result. “I think it was a masterful piece of marketing. The company came in with a product that we felt we needed at a time we felt ready to use it, and with the training to use it. So in marketing terms, I think it’s probably used around the drug industry as an example of good marketing that they’d all die to mimic,” he said.

Sanofi has maintained that Insulin for Life was not explicitly linked to the promotion of insulin glargine. But a simultaneous marketing drive for the drug muddied the waters. Glargine was seen by some to be too closely allied to the scheme. Complaints were received by the PMCPA and Medicines and Healthcare Products Regulatory Authority (MHRA) about the campaign. The PMCPA stated that while the scheme was not in breach of the code the briefing material linked the provision of the service to the use and promotion of glargine, which in effect meant that the service was unacceptable.

In another judgment, the MHRA examined a complaint about the role of the nurses funded by Sanofi to provide supervision and practical advice to primary care staff taking an extended course element of the scheme known as a “Statement of extended practice” certificate. The MHRA did not uphold the complaint about the nurses’ incentive scheme—which gave financial rewards for results such as the number of practice based diabetes audits, the number of courses arranged, the number of clinics run, and the number of people started on insulin—because the drug company funded nurses were not responsible for prescribing decisions and the scheme was designed to provide an incentive for successful training practices not the prescription of medicines. However, the MHRA also stated that “relating the remuneration given to individual nurses to the number of insulin starts made in the practices they support and for changes in dose was very ill-advised.” At the time of the MHRA’s findings, Sanofi stated that the incentive scheme was no longer running and that it would not be undertaking a similar exercise in the future. A spokesperson said: “The concerns raised in 2004 about Insulin for Life were fully addressed at the time. The programme, which teaches clinicians how to start, not switch insulin, is highly regarded by those who have taken part, and has been shown to
positively improve the health of their patients.”

Sanofi, of course, is not alone in providing educational and practical assistance to primary care staff dealing with diabetes. Not to be outdone, Novo Nordisk also funds a training programme, known as MERIT (meeting educational requirements, improving treatment) in Diabetes. Discussing the scheme at the Pharmaceutical Marketing Society in November 2008, Jean Woodwar, the head of Novo Nordisk’s education programmes, set out the interplay between the educational and commercial objectives of educational schemes such as MERIT.

“Chronic disease management (including diabetes) is currently being moved from secondary to primary care. Unfortunately primary care is expected to take this on but without the upskilling and education being provided to go with it.”

Noting the shift in diabetes management from secondary to primary care and the need for greater skills among primary care staff, she explained that “MERIT was designed to fill this gap. It is a win for the NHS and also for Novo Nordisk, 80% of whose business comes from diabetes. Another objective was to improve care for patients on insulin—by appropriate dose titration or changes in insulin regimen. The third objective was to identify customers in primary care and build relationships with them enabling rep access.”19

A year earlier Watermeadow Medical, a medical communications company, announced it had been nominated for a pharmaceutical marketing effectiveness award for its work on behalf of Novo Nordisk in developing MERIT.20 It has also provided writing assistance for numerous journal papers on insulin detemir.21

Cutting choice

The push towards analogues is supported by the corresponding withdrawal of cheaper human insulins by drug firms. This has been a steady feature of the insulin market for some years, and one critics claim is designed to encourage the switch to analogue insulins. At the end of December, Novo Nordisk will withdraw Mixtard 30, a popular and well tolerated biphasic human insulin from the UK. Its 90000 or so users will be forced to seek alternatives, some no doubt moving to analogues. However, Mixtard 30 will remain on the market in other parts of Europe under the brand name ActoPhane 30.

What may lie behind this global switch campaign was set out by Jesper Brandgaard, chief financial officer of Novo Nordisk, in an interview on CNBC in 2006. He said that generic competition provided a threat to the human insulin market.

“We are about to convert the market from human insulin on to insulin analogue,” he said. Adding: “If we look at it globally, we have more than 40% of the market now converting to analogue. So we are actually in a different situation from most other companies. We are taking our portfolio from being generic product, human insulin, on to a patent protected insulin analogue. So we are actually getting our portfolio on-patent, not off-patent.” According to Craig Currie, reader in diabetes pharmacopeidiology in Cardiff, Novo Nordisk also needs extra capacity to manufacture a newer insulin it is developing called degluced.

But this debate on human versus analogue insulin is just one part of the debate around funding of diabetes care. A 10 year report by Dr Currie and colleagues on diabetic patients using insulin finds that average HbA1c remains at 8.6%. The paper says: “Over the 10 years to 2007, diabetes related primary care adjusted costs increased considerably, whereas glycated haemoglobin values did not improve at all over the same period.”21 In which case, are we really getting value for money out of diabetes care?

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Competing interests: None declared

Provenance and peer review: Not commissioned; externally peer reviewed.


Cite this as: BMJ 2010;341:c1739
2010: a nudge in the wrong direction

With scandals in the headlines and a new government making its mark, 2010 will not go down as a good year for medicine, says Jeremy Laurance.

The NHS started 2010 in the peak of condition. Funding was at an all time high, waiting times at an all time low. Heart disease and cancer deaths were heading down, hospitals and health centres going up. The medical workforce was the largest ever, and public satisfaction was at record levels. The health service had never had it so good.

But by the year’s end, it was looking pale and feverish. Funding was frozen, savings being demanded, and cuts being made. Days after the election in May, the coalition government promised no more top-down reorganisations of the NHS—before launching the biggest reform in its history. And no one seemed to know why.

Elsewhere, there were comings and goings. MMR vaccine refusenik Andrew Wakefield, “legal high” mephedrone, NICE’s rationing role, diabetes drug rosiglitazone (Avandia), and two experts from the WHO’s pandemic response committee went (or were on their way out). The Mid Staffordshire inquiry, the cancer drugs fund, food firms’ role in public health, and the importance of brushing your teeth came (or were coming). It was the year of nudge.

25 February: Hospital scandal
In one of the darkest days in NHS history the report of the inquiry into the Mid Staffordshire NHS Foundation Trust painted a picture of healthcare in Britain that belonged to another age. Patients were left lying in soiled sheets, crying out in pain, frightened and ashamed, and so thirsty they were forced to drink water from flower vases. Care was so lacking in the basic essentials that lives were sacrificed as a result, Robert Francis QC, the chairman said. A focus on financial targets rather than patient welfare was blamed for the culture of low morale and tolerance of poor standards. In answer to one of the biggest puzzles—how staff allowed the appalling care to persist for so long—the report found those who spoke out were ignored or deterred from doing so through bullying. In November the second inquiry, held in public unlike the first, was launched under the same chairman to ask how the regulators and the health authority allowed such a scandal to happen.

11 March: Genetics landmark
James Lupski showed for the first time that the technology of gene sequencing, touted as the future of medicine for a decade, was robust enough to yield clinically important results. The vice chairman of molecular and human genetics at Baylor College of Medicine in Houston, Texas, solved a 20 year puzzle by sequencing his own genome to reveal the precise genetic cause of the rare inherited condition that affects the nerves in his hands and feet—Charcot-Marie-Tooth syndrome. Publishing his findings in the New England Journal of Medicine, Dr Lupski declared, “This is the first time we have tried to identify a disease gene in this way. Currently we only know the function of 5 to 10 per cent of the approximately 25 000 genes in our genome that it takes to make a human being. What this paper tells us is that the data are robust enough that we can start to use it to interpret clinical information in the context of the genome sequence.”

30 March: Drugs crisis
The legal high mephedrone was banned by former Labour home secretary Alan Johnson, who acted after receiving advice from the Advisory Council on the Misuse of Drugs, which recommended it be designated a class B drug, along with cannabis and amphetamines. Far from settling the row about the drug, however, the decision merely deepened the war of attrition between the government and its scientific advisers over how to curb illegal drug use. By April eight members of the advisory council had followed former chairman David Nutt out of the door in protest at what they saw as political interference in their deliberations. In December the government introduced an amendment to the Police Bill, removing the statutory requirement for the council to include scientists among its 20 members.

16 April: Victory for science
Science writer, Simon Singh, won a historic victory when the British Chiropractic Association dropped its libel action against him. The
case lasted two years and cost him £200 000, only some of which he was able to recover. He had attacked the association for defending chiropractors who treat children with conditions such as colic and asthma, when there is little evidence such treatments work. The case provoked fierce debate about the “chilling effect” of English libel laws, silencing scientists and inhibiting the publication of good medical research. Cardiologist Peter Wilmshurst, sued by the US manufacturer of a device for closing holes in the heart which he criticised, is still fighting his case.

25 May: MMR verdict
Andrew Wakefield was struck off the medical register by the GMC, ending one of the most inglorious episodes in recent medical history. Twelve years after publishing the now infamous 1998 paper, which suggested a link between the vaccine, bowel disease, and autism, Wakefield was found to have acted “dishonestly and irresponsibly,” to have betrayed the trust of patients. He had attacked the association for defending chiropractors who treat children with conditions such as colic and asthma, when there is little evidence such treatments work. The case provoked fierce debate about the “chilling effect” of English libel laws, silencing scientists and inhibiting the publication of good medical research. Cardiologist Peter Wilmshurst, sued by the US manufacturer of a device for closing holes in the heart which he criticised, is still fighting his case.

Andrew Lansley announced in a white paper the most radical shift of power and accountability in the NHS’s 60 year history—general practitioners would become the chief budget holders for the NHS, buying in services for their patients rather than relying on primary care trusts to do it for them, and foundation trusts would become privately run not for profit enterprises that would ultimately leave the NHS and sell their services back to it.

The aim was to create a regulated market of competing providers driven by patient choice and GP commissioning, free of direct management from politicians and the Department of Health. Hence the white paper’s title: Liberating the NHS.

Far from liberating it, Sir David Nicholson, NHS chief executive, warned of “stalinist” controls during the three year implementation phase. By the year’s end he was admitting primary care trusts were in “meltdown” as more than 2000 managers jumped ship with redundancy packages. The BMA and Royal College of General Practitioners warned of destabilisation, and the King’s Fund urged ministers to slow down. Stephen Dorrell, chair of the Commons health select committee and a former Tory health secretary, warned that efficiency gains of the kind required—4% a year over the next four years—had never been achieved by any health service anywhere in the world. Yet Mr Lansley expects the NHS to pull off this miracle while simultaneously achieving another—switching control of the bulk of the NHS budget from managers to GPs. The jitters in government can already be felt.

27 May: Life saving toothbrush
It only takes a minute and it could save your life. People who neglect their toothbrush have a 70% higher risk of heart disease than those who brush twice a day, a widely quoted study in the BMJ found (BMJ 2010;340:c2451).

The results, from the Scottish Health Survey, confirm what researchers have long believed—that there is a close link between periodontal disease, inflammation, and coronary heart disease.

4 June: The drug industry and WHO
A BMJ investigation into potential conflicts of interest at the World Health Organization over its response to the swine flu pandemic garnered international media coverage and led to the resignation of two experts from the committee reviewing WHO’s response. WHO was under attack, along with many governments, for over-reacting to the pandemic, and the BMJ raised questions about its transparency (BMJ 2010;340:c2912).

It noted that three WHO advisers who helped develop pandemic guidance had some industry ties and that John Mackenzie, chair of the WHO emergency committee, was also on the committee reviewing the pandemic response.

Mackenzie and a second expert, Anthony Evans, an aviation medicine specialist, later withdrew from the committee. WHO strongly defended its pandemic response and denied any improper industry influence, but it agreed that it needed to strengthen its policies on transparency and on relations with the drug industry.

6 September: Dubious drug
Rosiglitazone, the diabetes drug made by GlaxoSmithKline, once one of the biggest sellers in the pharmaceutical pantheon, found itself in the spotlight for all the wrong reasons.
For two years the drug had been at the centre of a safety scare after it was linked with an increased rate of heart attacks in 2007. In March the BMJ published an investigation by Mayo Clinic researchers showing that nine out of 10 scientists who backed the drug had financial links to the drug industry. It was the end of an era for the National Institute for Health and Clinical Excellence (NICE), the body that has set a benchmark for rational—and thus humane—prescribing around the world. The establishment of the cancer drugs fund, enabling patients to get the drugs their doctors decree, bypassing NICE, was attacked by critics as a victory for the cancer lobby. It would no longer be the arbiter of which drugs would be available on the NHS. That decision will in future be left to GP consortia. It will, however, still issue its assessments of cost effectiveness in the usual way, which will form the basis of GPs’ decision making. The assessments will also serve as the starting point from which “value based” pricing deals will be negotiated.

**3 December: The power of nudge**

Nannying is over. In its place comes “nudge”—the modern way to change behaviour to improve public health. Andrew Lansley, formerly a director of a marketing company with junk food clients, launched a white paper on public health aimed at encouraging people to lead healthier lives with nudges in the right direction rather than “nannying” from the state. Mr Lansley said the government would seek to persuade people to adopt good habits using incentives such as vouchers for healthy living and for pupils who walked to school, rather than use legislation. Public Health England, a new body within the Department of Health would be set up to oversee national programmes such as vaccination, screening, health visitors, and family nurses. Local authorities will take charge of the £4bn budget, ring fenced for the first time, but not till 2013. Critics worry that nudges will not be enough, that the retreat from regulation will leave the nation sicker, and that food and drink firms have been given too large a role in setting public health policy.

**A particular bone of contention is over alcohol where, as in Scotland, the English coalition government has backed away from introducing minimum prices, favoured by the Association of Chief Police Officers and the BMA. Instead ministers support a ban on “below cost” selling, though this measure was not included in the Police and Social Responsibility Bill published in December. In its place, the Treasury laid proposals to raise tax on lagers with over 7.5% alcohol, which will affect less than 1% of UK alcohol sales. It will be a happy new year for the brewers.**

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Provenance and peer review: Commissioned; not externally peer reviewed.

Cite this as: BMJ 2010;341:c7248
Free healthcare in Sierra Leone

We are working with Save the Children to raise £30 000 to help children and mothers in some of the world’s poorest regions. Money raised will be invested in projects such as the one described here by Kimberly S Johnson

A harness on a scale that resembles a meat hook suspends a baby in mid-air. Other babies cry as mothers make feeble attempts to console them while talking to nurses and other staff. Pregnant women study bright pink cards used to track their progress at each check-up.

In a nearby room, a mother lies motionless and slightly dazed on a dirty, worn, uncovered hospital bed as her baby—a few hours old and very pale—sleeps deeply, wrapped in traditional cloth on a battered table.

It’s a bustling scene at the Kroo Bay Health Centre in Freetown, Sierra Leone, one of the government backed health centres offering free services for children under 5 years and pregnant or breastfeeding women under the healthcare programme that began in April. Women and young children stream in all day, seeking treatment they would be unable to receive without the programme, which heavily relies on donor funds.

“I would have brought my baby to the hospital [before the free healthcare programme], but I wouldn’t have been able to pay,” explains Jaria Barrie clutching her son, Alhassan, who has been defecating large worms for a few days.

The health centre is one of six in Freetown supported by Save the Children, which provides medical equipment and supplies. The equipment and supplies range from clean needles, stethoscopes, and blood pressure monitors, to sterilisation drums and examination couches.

The organisation also provides training in data management, explains Saffa Smart, health programme manager for Save the Children in Freetown, because the main goal is to reduce child and maternal mortality. Sierra Leone’s maternal and infant mortality consistently rank as the worst in the world. According to the country’s 2008 Demographic and Health Survey, infant mortality is 89 deaths per 1000 births and maternal mortality is 857 deaths per 100 000 births. One in seven Sierra Leonean children die before the age of 5.

More than 17 000 people live in Kroo Bay, one of Freetown’s biggest slums, according to official statistics. Save the Children rehabilitated the community’s health centre, with additional support from Concern Worldwide.

There is no doctor at the centre—a community health officer is the top medical official. The work is pure triage, with only the most severe or advanced cases referred to a doctor at a government hospital. Gibrilla B Timbo, the centre’s community health officer, says the most common ailments affecting children here are malaria, diarrhoea, pneumonia, ear infections, and acute respiratory tract infections in newborns.

Before the free healthcare programme, or “free well bodi,” as locals describe it, 50-70 women and children would visit the clinic monthly. That monthly figure has doubled, according to Joanna Joseph, health assistant programme officer for Save the Children in Freetown.

Preventive care

Promoting good habits is key to good health, Mr Timbo says, so he asks every mother to demonstrate how she breast feeds. Mothers are also given a growth monitoring chart to record the child’s weight and other vital statistics during each visit. Mr Timbo explains to one mother that since her child’s weight falls within the yellow range of the colour coded chart, it is a warning sign. The clinic gives out ready to use therapeutic foods for children at risk of malnutrition.

“You are going to contribute to healing your child,” Mr Timbo tells another mother. After demonstrating how to apply medicine to fight the infant’s ear infection, he shows her how to check for anaemia—by comparing the colour of the baby’s palms to that of her own. “The workload is high for the doctors at the hospitals,” he says, adding that the centre can solve many basic health problems before more complex medical complications set in.

The mothers are often young and in many cases accompanied in the waiting rooms by traditional birth attendants, who are often older women in the community. Although paid work has decreased substantially for traditional birth attendants, these women are instrumental in ensuring pregnant women get the antenatal care they need.

“When they’re pregnant, we bring them in if they have oedema, are losing blood, limping, or have convulsions,” said Soko Dumbuya, chair of the birth attendants’ informal group in Kroo Bay, as a pregnant woman begins having pains and is whisked away by another birth attendant.

There used to be one or two maternal deaths a month in Kroo Bay before the start of the free healthcare programme, said Ms Joseph. Postponement of antenatal care until late in the pregnancy delays diagnosis and treatment of problems such as pre-eclampsia, she said. Women would die from eclampsia, as well as haemorrhaging after delivery, infections, and other complications during childbirth. But there have been no maternal deaths recorded by staff at the Kroo Bay centre and Save the Children since the free healthcare programme began, Ms Joseph said.

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Competing interests: None declared.

Provenance and peer review: Commissioned; not externally peer reviewed.

Cite this as: BMJ 2011;342:c7268

Save the Children is this year’s BMJ Christmas charity. Readers in the United Kingdom can donate £3 by texting GIVE to 70555*. You can also donate at www.savethechildren.org.uk/bmj.