

Quantifying the benefits of investment in Healthcare IT in Poland

In 2002, the UK launched the world's most expensive civil IT project; the £ 12 billion National Programme for IT in the National Health Service. The software is set to replace hundreds of different computer systems spread across hospitals and doctor's practices with new, compatible versions that will allow NHS staff anywhere in England to access a patient's medical records.

In 2009, it was announced that the project is likely to be four years late and over budget. Even the proposed savings to the NHS budget – of £ 1.14 billion by 2014 – don't come close to covering the cost of the investment.

That said, there is evidence that investment in IT does yield efficiencies and economic opportunities. A Brookings Institution study, in July 2007¹, found that – in the US – “for every one percentage point increase in broadband penetration in a state, employment is projected to increase by 0.2 to 0.3 percent per year.” However, numerous² studies³ have pointed out the difficulty of quantifying the economic effects of such a ubiquitous and pervasive product.

Frost & Sullivan, specialist analysts in market risk and growth consulting, have considered the impact of healthcare broadband and IT investment in Poland. Over the period 2003 to 2008, Polish unemployment is down 6.7%, infant mortality is down 4.7% (from 2000 to 2006), while total health expenditure per capita rose 8.2% (between 2000 and 2006), Internet users rose 25.6% (between 2000 and 2006) and mobile phone users rose 32.7% (between 2000 and 2006)⁴.

Industry leaders bemoan the lack of centralised standards. This goes further than just IT solutions, down to the format and type of data that is collected for medical records. Despite these experiences, companies investing in e-health systems report significant business growth and opportunities as EU funding drives investment. Industry leaders describe a “second wave” of healthcare IT investment as the systems implemented a decade ago reach their maximum lifespan and are replaced.

This Frost & Sullivan white-paper on *Quantifying the benefits of investment in Healthcare IT in Poland* will discuss whether lessons have been learned from the failings of investment in the early 1990s and what opportunities exist for current investors.

¹ The Effects of Broadband Deployment on Output and Employment: A Cross-sectional Analysis of U.S. Data - Robert Crandall, William Lehr and Robert Litan, The Brookings Institution, July 2007

² The Digital Road to Recovery: A Stimulus Plan to Create Jobs, Boost Productivity and Revitalize America - Robert D. Atkinson, Daniel Castro and Stephen J. Ezell, The Information Technology & Innovation Foundation, January 2009

³ Measuring Broadband's Economic Impact - William H. Lehr, Carlos A. Osorio, Sharon E. Gillett, et al., presented at 20. the 33rd Research Conference on Communication, Information, and Internet Policy (TPRC), 23-25 September 2005, Arlington, Virginia; revised as of 17 January 2006

⁴ United Nations Statistics Division

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Overview

Poland has one of the biggest economies in Central Europe, and is the largest accession country to join the EU in 2004 with a population of 38.2 million.

Poland has seen positive economic growth in recent years, and has maintained a reasonable level of equality, with a small gap between rich and poor (GINI of 34.5). The poorest 20.0 percent earn \$5,861 per annum, while the richest 20.0 percent earn \$32,975 per annum.

In terms of international rankings, Poland is considered a moderate place to do business (World Bank Ease of Doing Business rank 72/183); a reasonable place to be a journalist (Reporters Without Borders score 18.5/115); and quite corrupt (Transparency International, score 4.2/10). The United Nations ranks Poland as of "high" development on their Human Development Index (HDI), with a score of 0.87/1.

In recent years, Poland has experienced reverse migration. With an improved economy, many Poles no longer seek employment opportunities in countries like Britain and Ireland and are returning home. Britain's Home Office has said that the number of applications by Poles seeking work permits from August 2007 to June 2008 fell 17.0 percent compared to 2006, down to 134,255 from 162,495. The rate of unemployment in Poland has fallen from 14.2 percent in May 2006 to 8.0 percent in March 2008.

That said, Poland suffers from extensive skills flight in the health sector, with doctors migrating to other countries due to low local remuneration. More than 4,000 Polish doctors have applied for Britain's General Medical Council (GMC) certification since 2004.

President Lech Kaczynski has called for a nationwide referendum on the privatisation of the health sector. Kaczynski said he intends to bring the issue to the Senate. Kaczynski also wants to ask the government to hold all bills regarding health care privatisation until this matter can be resolved by referendum.

Poland: Key Country Indicators

Population (Total - Both Sexes) (2008)	38,115,641
Population annual growth rate (%) (2006)	-0.1
Population in urban areas (%) (2006)	62.0
Balance of Payments - exports of goods, f.o.b. (2006)	\$117,000,000,000
GDP at market prices (2006)	\$339,000,000,000
GDP per capita (2006)	\$15,444
Gross outbound education enrolment ratio (2007)	1.03
Investment, direct, from abroad to reporting economy, n.i.e. (2006)	\$14,536,000,000
Graduates in Engineering, Manufacturing and Construction (2007)	46,328
Enforcing Contracts - Cost (% of claim) (2008)	12
Paying Taxes - Total tax rate (% profit) (2008)	41
Producer Price Index (2000=100) (2006)	116
Patents in force (2002)	14,319
Protecting Investors - Strength of investor protection index (0-10) (2008)	6
Trading Across Borders - Documents to export (number) (2008)	5

Table 1: Poland Key Country Indicators, data sources UN, IMF and World Bank

Poland's Economy within Europe

A flavour of Poland's major economic opportunities and risks is as follows:

- Polish Prime Minister, Donald Tusk, gave 2011 as the target for Poland to switch from using the Zloty to the Euro. By end-2009, the government aims to meet key euro membership criteria, including a low budget deficit, inflation close to the euro-zone average and falling debt.
- Since the opening up of the economy in the 1990s, Poland has received more than \$85.0 billion in foreign direct investment.
- From the beginning of the year until August 2008, over 700,000 personal automobiles and vans were produced in Poland, a 31.0 percent increase from 2007. In August alone, 54,300 vehicles were produced.
- The United Arab Emirates represents the largest market for Poland's exports. In the face of expected privatisation, Poland is looking at a possible investment from the UAE, particularly in the field of real estate. The volume of trade between the two countries stands at \$300.0 million annually.
- Czech power company, CEZ, plans to build two natural gas-fired power plants in Poland in the next five years. The two plants will have a capacity of 400MW and 800MW respectively. If Poland does not build new power plants, it risks suffering a capacity deficit of up to 6.0 percent between 2008 and 2014, as demand for power outstrips supply.

Within Central and Eastern Europe, Poland is an economic and demographic behemoth.

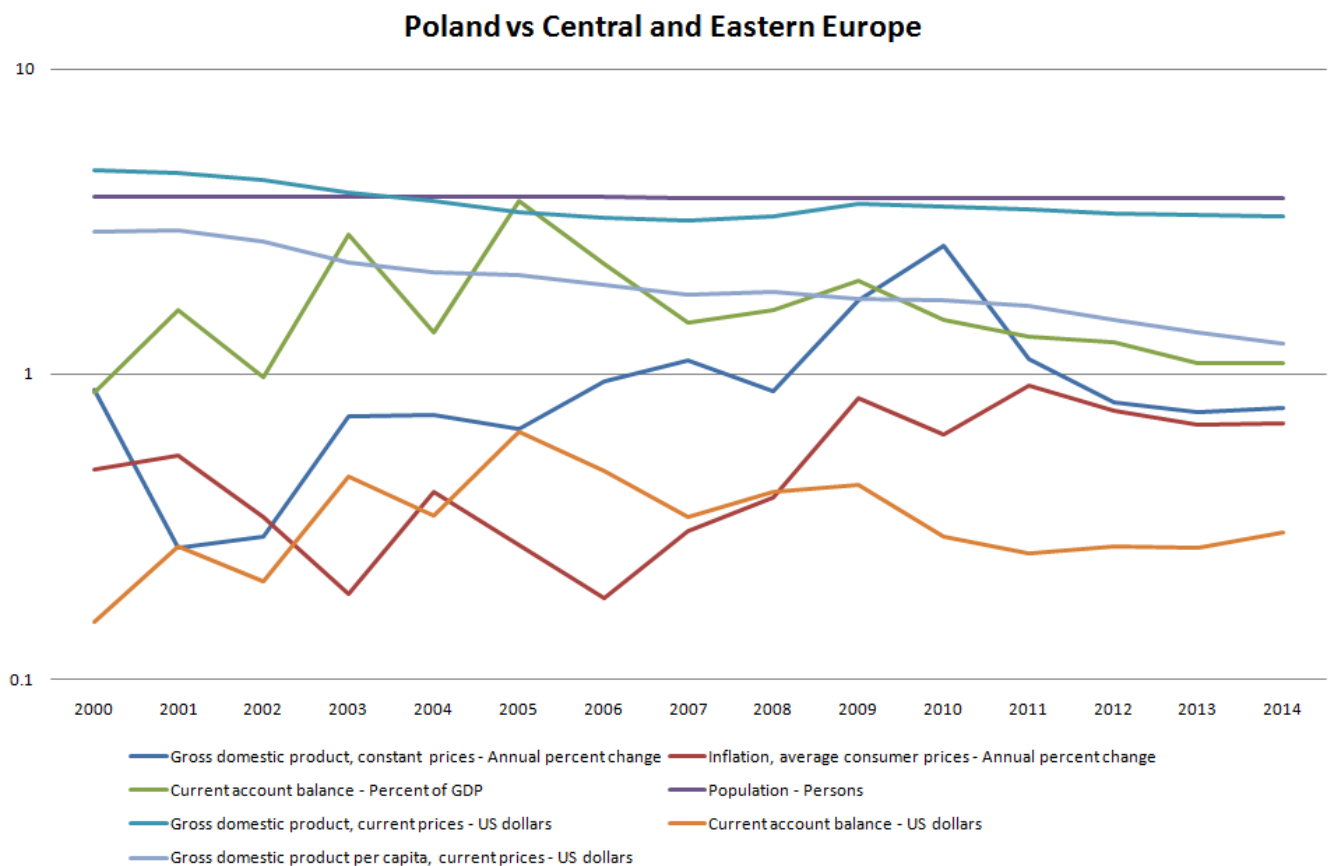


Figure 1: Poland vs Central and Eastern Europe, data source IMF World Economic Outlook (October 2009)

The graph in Figure 1 is derived from the proprietary Bue analysis system which allows complex comparisons of large data sets. Each criterion is compared to the median of the region and then rated on a log axis from 0.1 to 10. Any score larger than 1 is better than the median, and any score below 1 is worse.

Central and Eastern Europe includes the ten first-wave accession countries that joined the EU in May 2004 (Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, and Slovenia) and the two second-wave accession countries that joined in January 2007 (Bulgaria, Romania).

Figure 1 shows that Poland enjoys a large population and, accordingly, a larger GDP than do the CEE countries. However, with slow growth and a dramatic drop in GDP growth and exports after 2009, Poland is facing a decline in per capita income relative to the region. That said, Poland is the economic leader of CEE and will continue to dominate the region.

With the European Union 27, though, Poland appears quite different.

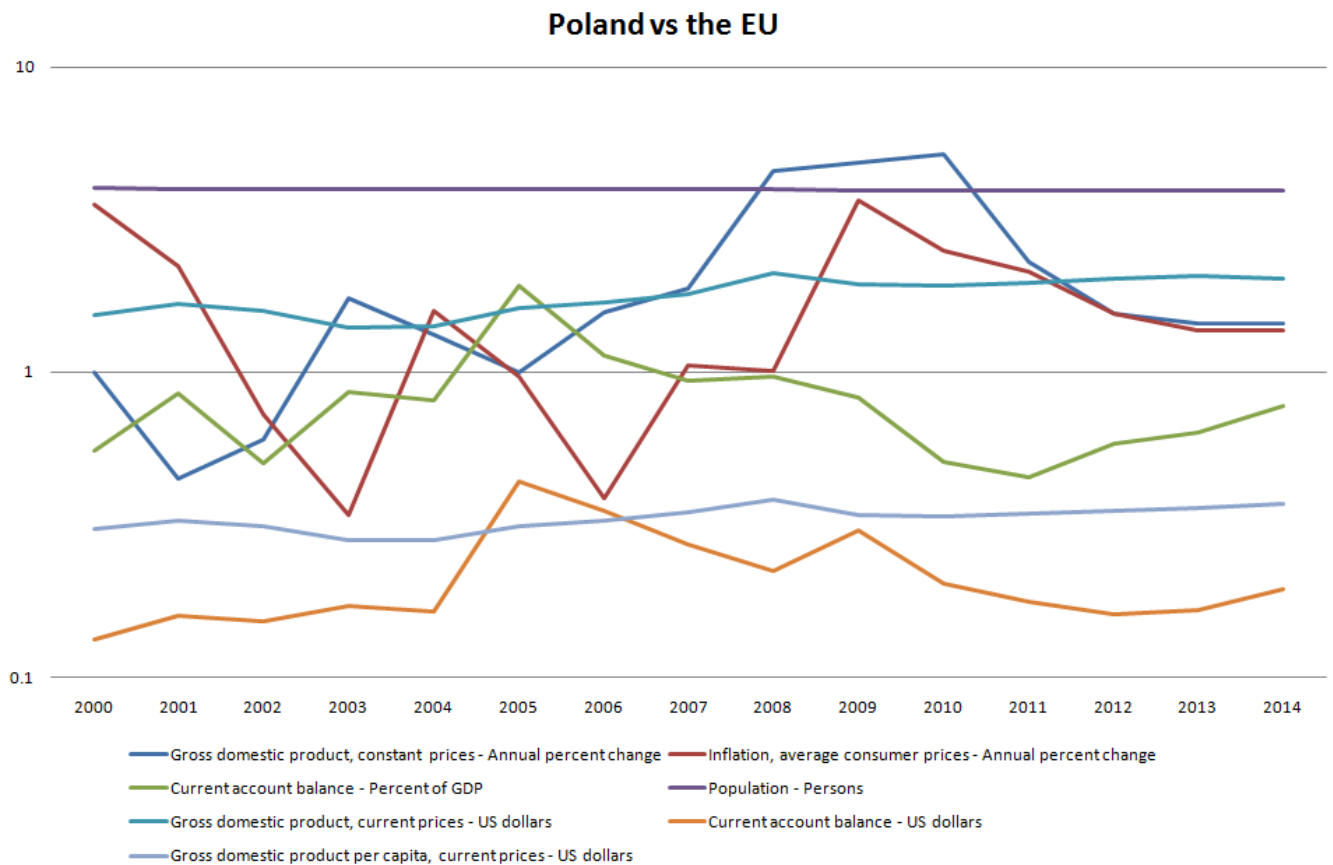


Figure 2: Poland vs European Union, data source IMF World Economic Outlook (October 2009)

Poland is still larger and poorer than the rest of the EU and, although growing faster than the region, may not be doing so sufficiently quickly to attract skilled migrants back home.

The credit crisis has certainly knocked Poland's economic prospects and made it much harder for the country to finance its ambitions.

Poland's Demography and Healthcare

Poland is enjoying both increasing life-spans and decreasing mortality rates even as their overall population growth-rate stabilises and matures.

Poland - Births and Deaths

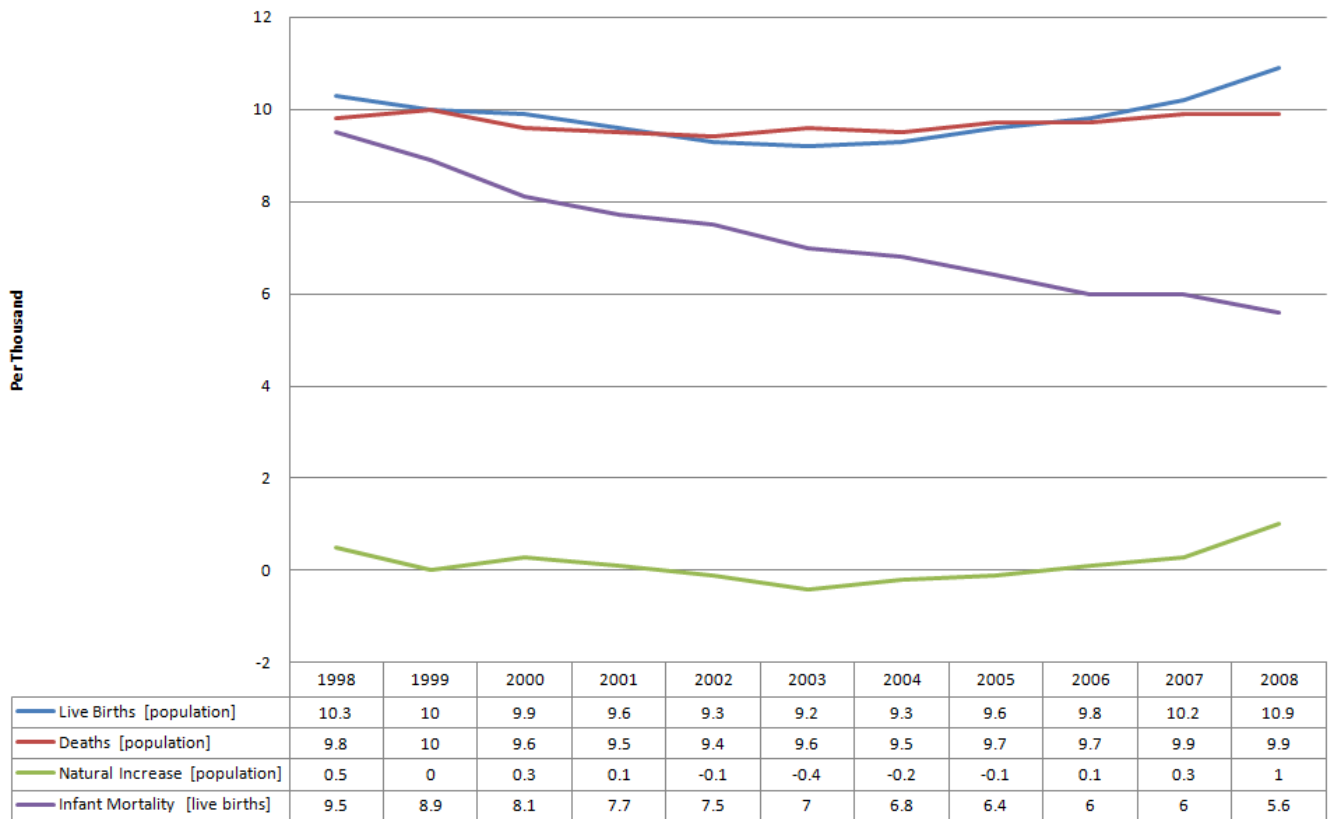


Figure 3: Poland Trends in Births and Deaths, data source Polish Central Statistical Office

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2015*	2020*	2035*
Men	68.9	68.8	69.7	70.2	70.4	70.5	70.7	70.8	70.9	71	72.3	73.4	77.1
Women	77.3	77.5	78	78.4	78.8	78.9	79.2	79.4	79.6	79.7	80.2	80.8	82.9

Table 2: Poland Trends in Life Expectancy, data source Polish Central Statistical Office
(* Projected Values)

Over the same period, healthcare support and infrastructure has remained fairly consistent.

	2000	2005	2006	2007
Physicians (per 10,000 population)	22.0	22.1	22.8	22.0
Nurses (per 10,000 population)	49.1	52.2	52.6	52.0
General Hospital Beds	190,952	179,593	176,673	175,023
Hospital Emergency Wards		126	183	180

Table 3: Poland Trends in Healthcare Support, data source Polish Central Statistical Office

The trend of decreasing general hospital beds and increasing resources for emergency wards is one obvious source of improving quality of life indicators. However, there is more going on than a mere reallocation of existing resources.

There is a net increase in the utilisation of healthcare services. In other words, despite a decrease in the number of hospital beds per capita (by 8.3% between 2000 and 2008), and a relatively

consistent number of healthcare professionals per capita, the actual number of outpatient consultations and inpatient admissions has risen (by 24.8% and 15.0% respectively).

	2000	2005	2007	2008
Outpatient consultations provided - Total (per 1,000 population)	6.1	6.8	7.3	7.6
Patients admitted to inpatient facilities (per 1,000 population)	156.2	176.6	178.0	179.7
Beds per person (per 10,000 population)	49.7	47.1	46.3	45.9
Persons who received health care benefits (per 1,000 population)		79.1	77.6	78.4

Table 4: Poland Trends Patient Support, data source Polish Central Statistical Office

The budgets for healthcare and hospitals have certainly increased (by a cumulative annual growth rate of 9.5% and 15.6% respectively since 2004), however, expenditure on medical care and drugs have remained constant.

	2004	2005	2006	2007	2008	2009
Total Healthcare Budget	937,628	1,066,203	1,201,457	1,452,176	1,949,035	1,476,319
Hospitals	69,549	74,702	63,856	84,871	143,022	143,640
Medical Benefits and Drugs	122,192	107,151	123,705	140,755	165,592	121,830

Table 5: Poland Health Expenditure (in US\$), data source Polish Central Statistical Office

So, while the overall health budget has gone up, it hasn't been spent on hiring additional staff or on more medical benefits and drugs.

The benefits have accrued through additional expenditure on infrastructure optimisation and refurbishment, as well as on technical infrastructure, which includes healthcare IT.

Healthcare IT in Poland

"The first wave of investment in healthcare IT started in the mid 1990's with the World Bank providing over 200 Polish hospitals with money for implementing basic IT infrastructure: patient movement, admission transfer discharge and hospital pharmacies. These then became the foundation on which hospitals began to expand their IT infrastructure, mostly funded by themselves," says Dr Krzysztof Groyecki of ABG, a Polish company who specialise in proprietary and custom software within the healthcare ICT market.

This first wave of healthcare digitisation was not a coordinated affair. Instead it was progressive with different IT systems implemented in different ways at different times.

"The problem with this was that for these different systems to work together, they need to be integrated. So if a series of modules was introduced by one company and another has to be added after a few years but that original company no longer exists you have a problem. Now what certain hospitals are doing is simply replacing the old equipment with new equipment all coming from one company," says Andrzej Wieczorek of Agfa, who specialise in PACS/RIS systems within the healthcare ICT market.

"No universal standard was put in place and to this day this is still a problem. When talking to various hospital IT departments in Poland, I often encounter the fact that HL7 is completely unknown to many hospitals. Also, you often have tenders for IT systems where the openness requirement that systems can communicate amongst each other using the HL7 format isn't even listed as a requirement. Not even the European Union has imposed the openness of systems. IHE is also unknown. Maybe 5% of IT engineers have heard of this standard," says Jacek Krol of Fuji, who specialise in PACS/RIS systems within the healthcare ICT market.

Towards the end of the 1990s, a debate on implementing a Register of Medical Services (Rejestracja Usług Medycznych-RUM) was launched. This register was supposed to be financed by the National Health Fund (NHF). The latest outcome from this project is the 1 billion zlotys (\$314 million) for investment in healthcare IT that the Polish government announced at the beginning of 2009.

Most of this budget is due to come from the EU, with a 20% input from the Polish government. There are three phases to this project, labelled P1, P2 and P3.

Dr Groyecki summarises the two main concerns about these new projects expressed by many in Poland, "The first point of debate is whether Poland is a country where you can implement a centralised system from the top in a market that is so scattered and dispersed. The second point of contention is the issue of patient privacy and confidentiality and the security of this type of information."

"There seems to be little cooperation between region/provinces. And here it's not DICOM and HL7 that is the problem, but rather how to fasten these systems at a higher level. There is no standardised MPI (master patient index), for example. Different provinces might have different requirements. So what if you have HL7 everywhere if you don't even have an agreement on what should be found in the MPI? The authorities don't seem to be imposing a structure that could make all of this work. Because there is no manual for best practices, every hospital has to reinvent the wheel," says Jacek Krol.

"Currently, about 31% of the healthcare market has digitised. PACS only really started in 2004 and it was all big experiment. The biggest growth came in 2006 and the market is currently growing at 125 to 150 million zlotys (\$39 to \$47 million) a year. The fact that we are now witnessing the beginning of regional programs can only accelerate growth. For 2009, the size of the market (based on the all budgets available for the digitization of hospitals) is expected to be at around 1 billion zlotys," says Andrzej Wieczorek. "Penetration of PACS/RIS is at 37% in Poland. Fuji did the digitisation of LIM-LUXMED, two private clinics across Poland. EnelMed has four to five installations by Agfa. Medicover is the largest as it has 26 units. They have a fully digitised hospital in Warsaw.

Half of the private clinics are digitised.”

Industry insiders believe that there are three factors which can convince a hospital director to invest in healthcare IT:

- 1) Legislation,
- 2) The hospital sees an interest in optimisation, or,
- 3) Hospitals don't have the specialists needed to interpret image diagnostics and so they need to be sent out.

“Currently the main motivation for hospital managers is cutting costs. With digitisation you can cut costs of materials used: ink, paper, etc. They have the last word in terms of investments made by the hospital. As for doctors, the interest is using new and improved technology to perform better diagnostics. The money aspect doesn't concern them at all,” says Andrzej Wiczorek

Krol, though, is concerned about the lack of a direct connection between returns and investment. “One of the things that you have to remember is that most of the funds that hospitals acquire are from the EU or government and are for a specific one time investment. It's not as if the hospital uses its own money and has to calculate whether the investment makes economic sense. You simply either get the money from the authorities or you don't,” he says.

This is very clear from the information available for analysis. There isn't any. Neither hospital administrators nor the governments or agencies investing the money have made much of an attempt to quantify what returns, if any, have been derived from these technologies.

These experiences are not unique to Poland.

At a recent conference on European healthcare IT investments, Cap Gemini presented their findings on returns on investment. Participants included people from the industry, Cap Gemini and RAND Europe consultants as well as EU Commission staff, including Ilias Iakovidis, Deputy Head of Unit, ICT for Health and Mike Palmer, Project Officer, ICT for Health.

Their conclusions were as follows:

- Despite all the funding and research efforts and numerous pilots and trials, results and conclusions have been very slow to arrive. It is felt that this is mainly because national governments don't push or invest effort into implementation.
- Sustainability of the projects will be paramount for pilots going forward. Money is and will always be available for setting up healthcare IT projects, however, finance to keep those same projects going in perpetuity will be a challenge and so these need to be sustainable on their own.
- Pilots and trials should be down-scaled, and instead focus within smaller regions that, for instance, use same standards of care, processes, and so on.
- Doctors need to buy-in and drive this themselves - otherwise there will be no market. It was done with pharmaceuticals, devices and equipment (CT, MRI, etc) it needs to be done with healthcare IT as well. For doctors to jump on board, speed of implementation is of paramount importance as well as not changing their existing workflows and ways of doing things.
- Treatment across the EU-27 is not universal. There will be focus on setting up organizations that will provide universal treatment guidelines for different disease areas across member states.
- A working group will be set up to look into defining a set of healthcare IT indicators to be used by national statistics offices, so everyone can use the same measurements.
- There is, however, a huge challenge of measuring outcomes in healthcare IT both before and after the investment.
- Interoperability is still an issue despite the different standards organisations. Systems do not communicate and vendors operate in silos.

Given all these limitations, it is unsurprising that data on results is not forthcoming. However, even if data were available, there would still not be base data (i.e. prior to healthcare IT investment) for comparative purposes.

Foreign investors into the Polish healthcare IT market have two problems: the incumbency of local businesses, and the difficulty of the state tender process.

"Historically, the hospital budgets allocated for IT were so small that foreign companies could not sell their solutions. Their prices were always twice as much as the local equivalent. Over the past 10 years, the Polish companies have acquired enough experience to significantly increase the quality of their solutions and services which has made it very difficult for foreign companies to offer solutions of a higher calibre with better functionality. The healthcare IT market is pretty stable and therefore the costs of entry for a new company are very high: implementation costs, training costs, costs of equipment change - all these costs are very high. This situation is a little different in the PACS/RIS segment. From the beginning foreign companies had a good foot-in because they did not have local competition," says Dr Groyecki of ABG.

"We have 60% of the market in terms of hospitals. Out of the 640 hospitals that have an IT infrastructure, we provide around 400 of them with our solution. In terms of healthcare provider services, we have around 40% of the market. Camsoft has 60%. With the NHF we have 50% and Camsoft has the other half. In the hospital market we have an advantage because we acquired two smaller companies and so we now have three hospital systems. UHC (Compgroup) has around 60 hospitals, Alma has 70 hospitals and Camsoft has the rest."

ABG has, after their acquisition of Hypocrates, Infomedica, and Solmed a disproportionate control of the Polish market. Their competitors are concerned that their proprietary systems are not HL7 compliant. Without such compliance, little interoperability will be possible.

However, such compliance needs to be written into the tender specifications. Often it is not.

"The procedure used for public tenders isn't efficient. The current system prevents hospitals from getting what they really want and it also slows down the process of digitisation. There are also no clear regulations in terms of diagnosis: we don't know what the parameters are and the regulations are often outdated," says Andrzej Wieczorek.

These regulations are in the process of being reviewed and it is hoped that they will be promulgated in 2010.

Conclusions

The expected returns on any investment in healthcare IT are that:

- It will reduce costs through streamlined processes and reduction of physical paper and manual labour;
- It will reduce errors caused in transcription between different physical formats which will then reduce errors in medication and diagnosis;
- It will improve collaboration between the different arms of healthcare and increase the overall quality of care to patients.

Consequently, all this documentation and tracking will allow for tracking of returns on the benefits of the investment itself.

If there is no agreement on the structure of a master patient index in order to track individual patients between institutions, then there can also be no agreement on what data to track regarding returns on investment. Without obvious returns measured in both lower costs and improvements to healthcare, it is very difficult to persuade the hospitals and doctors who must buy into such a system to do so.

There can be no doubt that investment in Polish hospitals over the decade of 1998 to 2008 has resulted in improved quality of life. The same number of doctors, working in a smaller number of hospitals, have delivered an improving standard of care. Yet, healthcare IT systems are not meant to replace doctors, merely to support them. It is clear that Poland has insufficient capacity and it is, therefore, unlikely that doctors have sufficient time to engage with new systems.

As the conference on European healthcare IT investments concluded, any new system must be implemented rapidly, must not interfere with the doctors' expected way of working, and must be immediately sustainable.