



Universal Data Warehouse of Healthcare

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Abstract— *Data warehouse is a large repository of data used in decision support system. Healthcare organizations are using data warehouse business intelligence (BI) tools and leveraging these tools to provide benefits realized through enhanced business operations and performance. Each country has many health insurance companies and each healthcare company has their separate data warehouse. It needs to analyse which country is providing better healthcare facilities, ranking highly, more healthy people, better procedure for diagnosis etc. These findings suggest opportunities for cross- national learning to improve health system performance. In this paper we will present a case study on implementation of universal Data warehouse which include information all healthcare insurance company of all countries.*

Keywords— *OLAP, Healthcare, Universal Data Warehouse, Business Intelligence, Multidimensional Database.*

I. INTRODUCTION

Today there is more health plans to choose from than ever before. Not everyone has a choice. But i due to more health planes become difficult choose the plan that offers the best quality for you and your family. Countries need to analyse findings which suggest that health system of which country is not delivering superior results despite being more expensive, indicating opportunities for cross-national learning to improve health system performance. Universal data warehouse (udw) can track healthcare policy developments in industrialized countries and findings from cross-national comparisons of health care systems can inform public policy, highlight areas where nations could improve, and yield benchmarks for high performance. Annually tracks and reports on more than 1,200 health system measures across 34 industrialized countries, ranging from population health status and non- medical determinants of health to health care resources and utilization. With the implementation of universal data warehouse countries can improve health care quality and countries can also analyse and compare the quality of health service provision across countries. Data on drug utilization and prices, as well as magnetic resonance imaging (MRI) prices, from other sources were also included. All country can also grow their business with help of universal data warehouse.

II. BENEFITS OF UDW

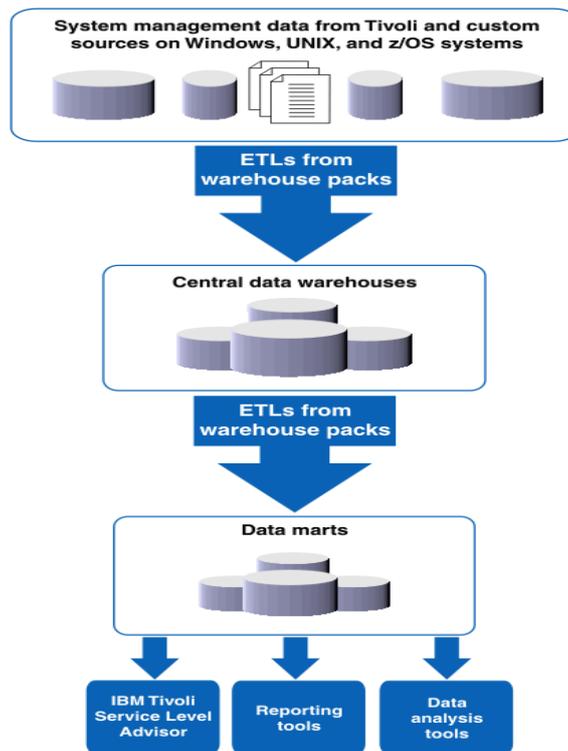
UDW simply collects the data from various disparate systems of various countries and centrally stores it in a way that enables BI tools to easily extract it. As data quickly builds, healthcare organizations can use this data to drive business strategy by turning it into meaningful information. There are benefits of UDW

- Compare the quality of health service provision across countries.
- Which country has high performance?
- Which country has more healthy people?
- Which diagnosis is influencing more and in which country.
- Manage patients as they move through the organization.
- Increase efficiency and accuracy of planning, budgeting, forecast.
- Which country is providing better facilities?
- Move toward quality healthcare objectives and pay-for-performance metrics.
- Improve workflow efficiency.
- Optimize insurance procedures.
- Gain insight into the effectiveness of patient treatments.

III. IMPLEMENTATION OF UDW

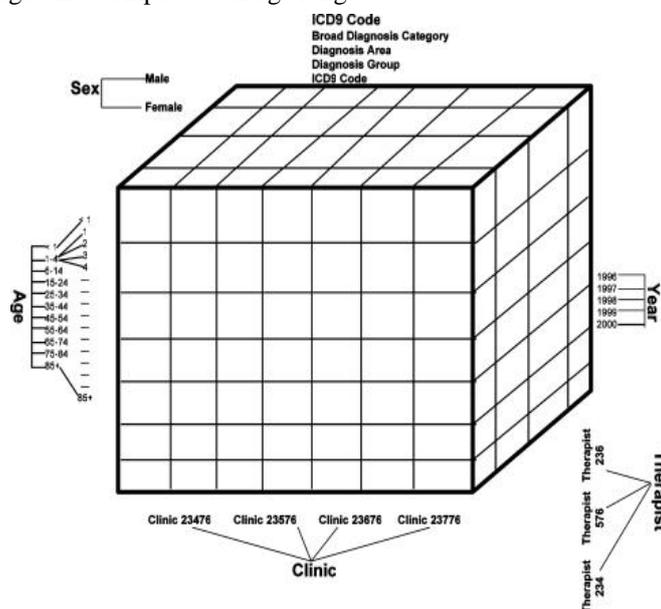
Data warehouse collect data from various data warehouse of healthcare insurance companies of different- different countries and data in Universal Data warehouse is stored in standardised format which is common for all countries.

The use of Universal data warehousing and data mining through business intelligence tools is widespread and well established in industries outside of healthcare. As healthcare organizations find more value in data warehousing and BI tools, this technology is experiencing significant growth also spurred by external factors such as governmental policy and deadlines. Along with rapid technology growth comes challenges and evolving design, build, and support issues.

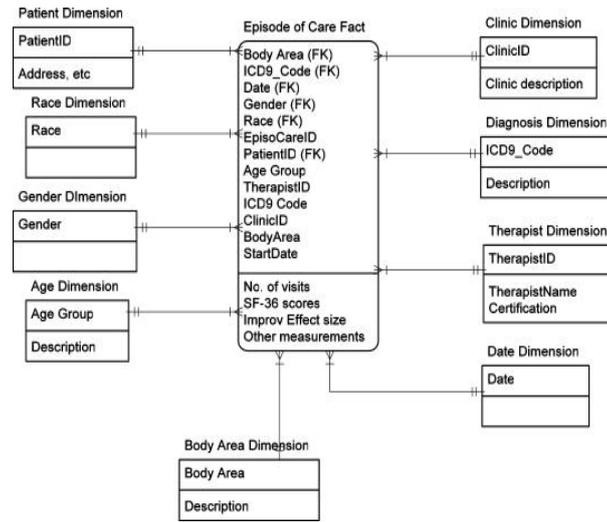


IV. BUSINESS INTELLIGENCE TOOLS OLAP

OLAP is decision-support software that allows the user to quickly analyse information that has been summarized into multidimensional views and hierarchies. A database that stores OLAP data has a multidimensional framework that can be represented as a data cube, instead of the typical tabular format seen in traditional databases. The cube contains dimensions, or types of information stored in the data warehouse. As shown below is an example of an OLAP cube for healthcare rehabilitation data. The dimensions are age, sex, clinic, ICD-9 code, year, country and therapist. Each dimension has a hierarchy that defines the dimension. For example, in this cube, the age dimension is defined as a series of age ranges and the specific ages that compose each age range.



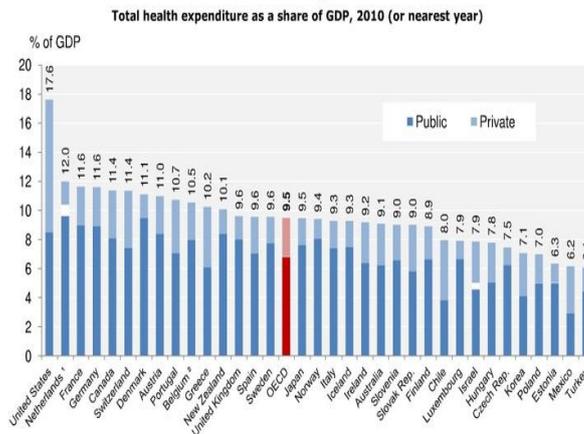
Dimensional modelling is a data warehouse design technique that uses a data structure similar to the easily understood entity-relationship (ER) model but is sophisticated in that it supports high-performance data access. Dimensional modelling refers to the process of designing the structure of a data warehouse through illustrations that show relationships between data tables. An example of dimensional modelling, also known as “star schema”.The similarities between the traditional ER model and dimensional modelling are apparent: tables (or entities) have joins (or relationships) with other tables via primary keys. This method of data warehouse modelling has been used in standard industry for years for decision support in such areas as transportation, production, sales, and marketing. Data warehouse design for industries outside of healthcare is well understood and has been covered extensively. Healthcare is well behind in the area of data warehouse management and decision support and needs to move forward in this direction.



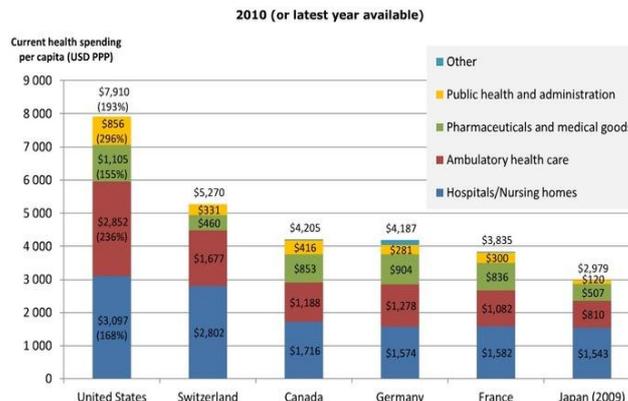
V. FINDINGS FROM UDW

- Health Costs:** - we can Compare cost of health with Other Countries. The U.S. is a very rich country, but even so, it devotes far more of its economy 17.6 percent of GDP in 2010 to health than any other country. The Netherlands is the next highest, at 12 percent of GDP, and the average among OECD countries was almost half that of the U.S., at 9.5 percent of GDP.
- Particular areas of care where the U.S. spends more:** - Spending on almost every area of health care is higher in the United States than in other countries. For example, nearly \$900 per person per year goes on administrative costs. This is far higher than in, say, France, which spends \$300 per person, but which also, has a system in which health care services are reimbursed in a similar way to the U.S.

At 17.6% of GDP in 2010, US health spending is one and a half as much as any other country, and nearly twice the OECD average



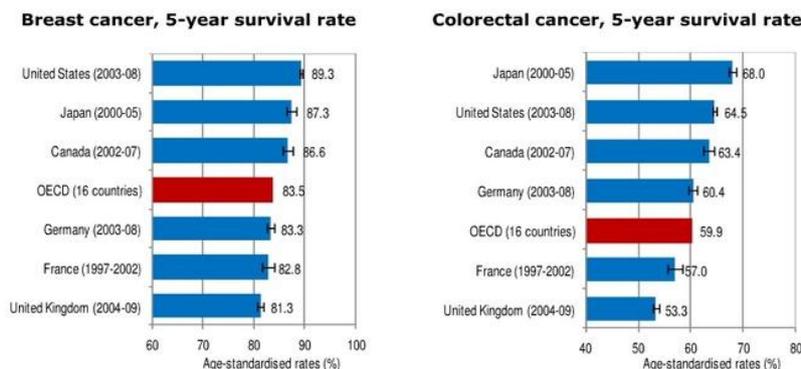
US health spending is much greater for all categories of care, particularly for ambulatory care and administration cost



Note: Health spending excludes investments. The percentages in the US bar indicate how much more the US spends per category compared with the average of the five other OECD countries. Source: OECD Health Data 2012.

3. **Comparison of cancer system performing well:** - Health Data shows that the five-year survival rate for breast cancer is higher in the U.S. than in other OECD countries survival from colorectal cancer is also among the best.

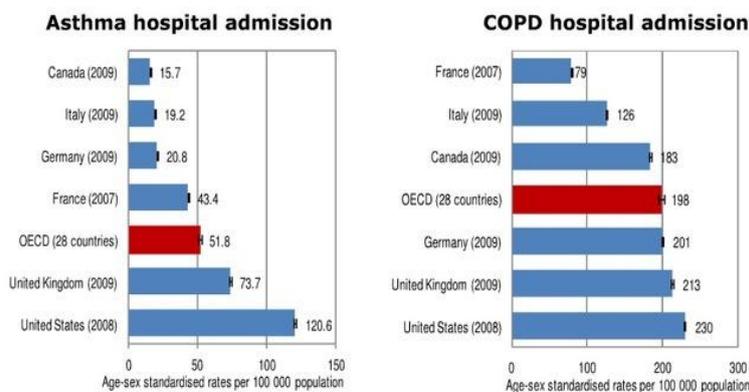
Cancer system is generally performing well



Note: 95% confidence intervals are represented by H.
Source: OECD Health Data 2012.

4. **Primary sector not performing well:** - A similar picture emerges for chronic obstructive pulmonary diseases. These outcomes can be improved through better health care. In a Commonwealth Fund survey of seven nations (Australia, Canada, Germany, the Netherlands, New Zealand, the United Kingdom, and the United States), 16 percent of American patients reported delays in being notified about an abnormal test result (the highest proportion reported) and only 75 percent of primary care physicians reported often or always receiving correspondence from specialists after referral suggesting systemic problems with care coordination.

Primary care sector is not performing so well



Note: 95% confidence intervals are represented by H.
Source: OECD Health Data 2012.

VI. CONCLUSION

Universal Data warehouse tracking the health care policy developments in industrialized countries; preparing presentations; monitoring the research projects and also help in finding diagnosis code which require more attention .Findings of UDW can help in improve health system performance and highlight areas where nations could improve, and yield benchmarks for high performance. This also helps to find out country which has best treatment for a particular diagnosis. UDW also help in compare the quality of health service provision across countries.

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