VIEWPOINT

The Innovation-Remuneration Index (IRI). Making pharmaceutical companies report what matters about innovation.

Adam Cohen MD PhD, Professor of Clinical Pharmacology[1]
Rebecca Ultee BSc, Student Bio-Pharmaceutical Sciences [2]
Glenn van Veldhoven, Student Bio-Pharmaceutical Sciences[2]

[1] Leiden University Medical Centre Leiden University, [2] Leiden Academic Centre of Drug Research

Correspondence

A F Cohen MD PhD FFPM FBPhS
Leiden University Medical Centre
Leiden, The Netherlands

ac@ddcd.nl

Word count: 1506

Contributors and sources

Prof. dr. A.F. Cohen is professor of clinical pharmacology at the Leiden University Medical Centre and was founder and director of the Centre for Human Drug Research in Leiden. He was among others, editor in chief of the British Journal of Clinical Pharmacology, and vice-chairman of the Central Ethics Committee and trial Competent Authority of the Netherlands. Rebecca Ultee and Glenn van Veldhoven are students of Bio-Pharmaceutical Sciences at the Leiden University. Rebecca obtained her Bachelor degree in 2020 while Glenn is in the process of obtaining this degree.

Information was obtained from the websites of the companies and the register of The United States Security and Exchange Commission.

Abstract

There is a lack of transparency about the cost of innovation of the pharmaceutical industry even though these costs are claimed to be the major driver for high prices for medicines. This is reflected by annual reports of the major pharmaceutical firms that contain a low number of pages on innovation and its detailed costs, in comparison to pages about remuneration of executives where the detail is excessive. The Innovation/Remuneration Index (IRI) provides an objective view of the transparency priorities of a company and has the potential to shift this focus in favour of transparent and detailed information on the cost of innovation.

The pharmaceutical industry elicits ambivalent responses from many sides. Pharmaceutical innovation has been essential for much of the progress in medicine, especially in the last century. However, it cannot be denied that the public response to the pharmaceutical industry is often negative, largely driven by high drug prices and excessive marketing activities. The profits generated by this activity have contributed to increased value of the companies for their shareholders and investors, but less so to the public.[1] The increasing cost of medicines has been explained by high risks and development costs spiralling upwards at much higher rates than inflation[2,3]. The available analyses of development costs were done by external consultants and academics and are never based upon audited information and therefore subject to potential bias. This is reflected by a large variation in the estimates from 3 billion to much less than 1 billion dollars[4] per new medicine. Additionally, the sample is not complete by any account as a recent study[4] by an academic group found only publicly available data on 18% of products. The highest estimate of about 2.6 billion[2] came from a group that was criticised for its sponsored links to the pharmaceutical industry. Currently, there are no audited figures available for the development costs other than at a very high level of integration, reflected in the overall R&D spend of the publicly quote companies.

The situation is quite different for the remuneration of executives of these pharmaceutical companies. There has also been much discussion about level of the remuneration of executives in all areas, including the pharmaceutical industry, the non-profit sector and governments. This has led to regulation requiring detailed reporting of executive compensation. In the US statutes only the regulations for this consist of 31 pages[5] . Such detailed rules are absent for the reporting of innovation costs. We studied the number of pages of reporting about executive remuneration in relation to what companies report on innovation, in publicly available information for shareholders and the general public.

Where is the emphasis of the annual report? Executive remuneration or innovation.

We used annual reports published on the website of the respective company or the 10-K form filed with the United States Security and Exchange Commission (SEC) with possible additions such as the 14A or the 10-KA form considered if necessary. Annual reports and other financial information were analysed according to a standard method (see supplementary information with this paper for details) to ensure comparability.

For the executive remuneration, most of the information was gathered from the proxy statement (schedule 14A complying with rule 14a-101 of the SEC[5]). Perhaps not surprisingly, finding pages on

innovation required more effort and the reporting on this vital aspect of the companies was not available in a comprehensive manner.

With this method we minimalised the total number of pages, to make a fair comparison. We calculated the ratio of the number of pages in the annual report used for innovation to those used for executive remuneration (Innovation Remuneration Index - IRI). Additionally, we evaluated the number of pages used to describe remuneration in comparison with the total number of pages in the annual report and additions. A high IRI implicates that the company reports relatively more about innovation than about remuneration. The higher the IRI, the more pages of the total number are used for remuneration, implicating less focus on other subjects.

Strong quantitative data about executive remuneration but little about innovation

Our findings were surprising and are shown in the table. Apparently, one of the most innovative branches of industry, found it in general appropriate to spend as much as 50 pages of dense text on the remuneration of executives, whose salary comprised little more than 0.01% of the sales. The R&D budgets of these companies is between 15 and 20 % of sales and was covered only qualitatively in as little as 4-5 pages. Moreover, variability in the ratio of the two types of reports is large with one company spending 54 pages on remuneration and 1 on innovation and another 38 on innovation and 3 on remuneration. None of the companies supplied quantitative information on the cost of innovation. Only 4 of the 15 companies spent more pages on innovation than on remuneration.

Should companies report more detail on cost of innovation?

Innovation is what drives a pharmaceutical company and generates the value for society and its shareholders. An argument against publishing a detailed breakdown of research and development costs would be that it would harm the company by jeopardising its competitive position. However, it could be argued that this may only hold only for a company operating in a perfectly operating market where prices would be optimal by the ‘invisible hand’ concept of Adam Smith. The sole problem of worldwide access of innovative medicines already demonstrates that this is not the case for medicines. This was perhaps recently poignantly illustrated by the tenfold price differences apparently paid by governments for different Covid19 vaccines. These prices were accidentally revealed by the Belgian Minister of Health, to the irritation of the manufacturers with whom it was agreed by the EU to keep the prices confidential.

The cost of innovation is an important component of the price of medication by the industry. No other industry reports such components of its prices in detail. But there it is assumed that the market

will do its work and that therefore more information than the price is unnecessary for the consumer. Mobile phones and computers are widely available at reasonable prices, also in low- and middle-income countries, but medicines are not. Additionally, medicines are rarely directly paid by its consumers, who in many cases do not have a choice between different products. These points would argue for a much more extensive transparency of the costs of innovation for the pharmaceutical industry compared to other branches to generate a more ideal market.

Some stakeholders probably will argue that such transparency would jeopardise innovation rather than promote it, but we consider this unlikely. There is considerable uncertainty about future sustainability of the current prize level of innovative medicines and price negotiations are generally based on theoretical assumptions of value in quality of life and are difficult to substantiate. A system that is also based upon development cost would introduce the cost of the development as a valid argument. By publishing these costs companies would have an incentive to make development maximally effective and competition would be introduced in a system that has become increasingly operationally heavy and ineffective with trial costs for some large trials exceeding 100M$. This would benefit investors and reduce development times. Reputationally it would also benefit the industry, by separating the costs of research, from pure development and especially marketing. Cost price transparency would also exactly define the cost of failure-a necessary component of development costs. Such new key performance indicators for the industry would also allow potentials shareholders to invest in the most efficiently operating companies.

We put the exquisite detail in which executive compensation is reported in juxtaposition to the apparent lack in transparency of research and development cost to counter the argument that detailed reporting of research and development costs for new medicines would be technically impossible. Apparently, it has been feasible to generate extensive regulation for executive remuneration so there is no reason why this could not be done for research and development costs, which will be readily available from internal cost accounting systems anyway.

There are no principal objections against the extensive reporting of remuneration, but we have demonstrated that there is a troubling disbalance in these reports. We question why it is apparently acceptable to report the executive compensation to the level of the private use of a mobile phone, while even the whole extent of the compensation is negligeable compared to the sales (and therefore can never affect pricing), while the main component of cost remains at the very high aggregation level of ‘research and development’. The disbalance is of course not solved by just reducing the detail of the executive compensation. This would improve our metric, but not the transparency.

Conclusion

All our medicines contain a very small and very precisely controlled amount of substance, which invariably has a low cost-price. The final cost of a medicine is therefore driven by other factors. The company must be sustainable and able to respond to new situations and this will require sufficient equity so a sustainable profit must be included. The advantages of this were all too obvious in the past period where the presence of technology in industry allowed rapid development of new vaccines. Such a profit must also cover the costs of failure. However, the main cost component of a medicine is information-the scientific facts that support the value-based[6] use in patients. Whilst we know precisely how the salary of the small number of executives is structured there is no objective information about this important component of the medicines, that we give to our patients. Expanding this information would eventually make medicines cheaper and more readily available and would benefit all stakeholders in this industry.

References

1. Cutler DM. Are Pharmaceutical Companies Earning Too Much? JAMA - J Am Med Assoc. 2020;323(9):829–30.

2. DiMasi JA, Grabowski HG, Hansen RW. Innovation in the pharmaceutical industry: New estimates of R&D costs. J Health Econ [Internet]. 2016;47:20–33. Available from: http://dx.doi.org/10.1016/j.jhealeco.2016.01.012

3. Mestre-Ferrandiz J, Sussex J, Towse A. The R&D Cost of a New Medicine [Internet]. Office of Health Economics. 2012. Available from: https://www.ohe.org/publications/rd-cost-new-medicine%0Ahttp://news.ohe.org/wp-content/uploads/2012/11/RD-Cost-Exec-Sum-+-Contents.pdf

4. Wouters OJ, McKee M, Luyten J. Estimated Research and Development Investment Needed to Bring a New Medicine to Market, 2009-2018. JAMA - J Am Med Assoc. 2020;323(9):844–53.

5. Securities and Exchange Commission. 17 CFR § 229.402 - Executive compensation. CFR US Law. 17CFR Chapter 11 229.402 2009 p. 1–31.

6. Porter ME. A Strategy for Health Care Reform — Toward a Value-Based System. N Engl J Med [Internet]. 2009;361(2):109–12. Available from: http://www.nejm.org/doi/abs/10.1056/NEJMp0904131

Table

Data on top 15 pharmaceutical companies ranked by 2019 sales. IRI = Innovation remunerationindex. The salary percentage is the CEO remuneration as fraction of total sales.

Company	CEO Salary (% sales)	Total pages report	Remuneration (pages)	Innovation (pages)	IRI
Johnson & Johnson	0.02	248	54	1	0.02
F. Hoffmann-La Roche Ltd	0.02	158	3	38	12.67
Pfizer Inc	0.03	186	44	26	0.59
Novartis AG	0.03	343	71	26	0.37
Merck & Co Inc	0.06	316	13	21	1.62
Eli Lilly and Co	0.10	187	23	6	0.26
Novo Nordisk As	0.01	117	15	7	0.47
AbbVie Inc	0.06	216	34	4	0.12
Amgen Inc	0.09	277	55	7	0.13
Sanofi	0.02	294	50	21	0.42
GlaxoSmithKline Plc	0.03	316	28	13	0.46
AstraZeneca Plc	0.08	276	23	46	2.00
Gilead Sciences Inc	0.13	241	18	41	2.28
Bristol-Meyers Squibb Co	0.07	226	51	6	0.12
CSL Ltd	0.14	143	15	10	0.67

194 Figure

195