

# Economic Evaluation of Ranibizumab in the Treatment of age-related macular degeneration in Austria

E. Walter<sup>a</sup>, C. Brenning<sup>a</sup>, K. Moeremans<sup>b</sup>, V. Thomas<sup>c</sup>

<sup>a</sup>IPF Institute for Pharmacoeconomic Research, Vienna, Austria; <sup>b</sup>IMS Health; <sup>c</sup>Novartis Switzerland

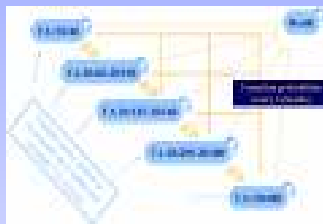
## Objectives

Age-related macular degeneration (AMD) is one of the most common eye diseases causing vision loss in western industrial nations. In Austria, about 25,000 people experience blindness in one or both eyes due to AMD. The incidence averages 3.000 to 4.000 people. The purpose of this pharmacoeconomic analysis was to evaluate the cost-effectiveness of the treatment of AMD with Ranibizumab versus Verteporfine.

## Methods

The analysis was conducted using a Markov Model designed to be flexible to target populations and was adapted to Austrian situation. Clinical data included in the model is based on three clinical trials (MARINA, ANCHOR and PIER). Evaluation of the effectiveness of therapeutic alternatives was determined by 'Vision Years' and 'QALYs'. The period under consideration was 10 years and the analysis was performed from the perspective of the Austrian health care system. Costs are represented using data from 2007. Treatment paths, resource consumption, costs as well as mortality data have been adapted for Austria.

Fig. 1: Model Design



The model includes six a priori defined health states depending on visual acuity. A change in visual acuity (>15 letters) leads to a passover to the next health state; the others remain. Discount rate was 5%. The model was classified in 40 3-month-cycles.

Source: Moeremans et al. 2006

## Resource Use and Cost

According to the Drug Disease Model Ranibizumab was administered 8 times within the 1st year and 7 times within the 2nd year (average values). Patients in the photodynamic-therapy-group (PDT) were treated 2,8 times within the 1st year and 1,1 times within the second year. Due to the fact, that PDT is performed inpatient in Austria (via DRGs), there occur no additional cost. AMD patients visit once a month an ophthalmologist. In Advance of every RAN-Injection an OCT is necessary. Adverse Events lead to inpatient cost as well as to additional consultations. The cost of blindness is based on a cost study by Meads and Hyde (2003). All other costs are from official Austrian price lists, tariffs and catalogues.

## Results

Within the 10-year period under consideration, the costs per QALY for Ranibizumab amount to 9,267€ and to 8,795€ for Verteporfin. Treatment with Ranibizumab leads to a QALY of 4.2, that of Verteporfin to a QALY of 3.91.

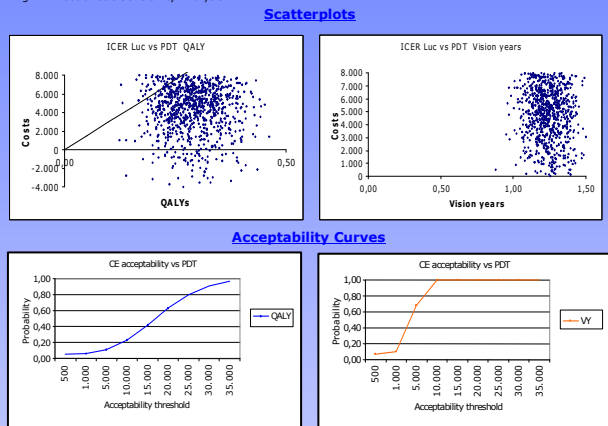
Tab. 1: Results in EUR

Strategy	Cost C	Difference Cost AC	Outcome (Vision Year) E	Difference Outcome AE	Cost-effectiveness C/E	Inkremental C/E ICER
Time horizon: 10 years						
LUC	38,891		2.85		13,641	3,642
PDT	34,370	-4,521	1.61	-1.24	21,351	
Time horizon: 10 years						
LUC	38,891		4.20		9,267	15,647
PDT	34,370	-4,521	3.91	-0.29	8,795	

Source: IPF own calculations

The incremental cost-effectiveness-ratio (ICER) is 15,647€. The costs per Vision Year amounts to 13,641€ (2.85 VY) for Ranibizumab and 21,351€ (1.61VY) in the Verteporfin-group. The incremental cost-effectiveness-ratio (ICER) is 3,642€. Sensitivity analyses – deterministic and probabilistic – demonstrated the robustness of the model results.

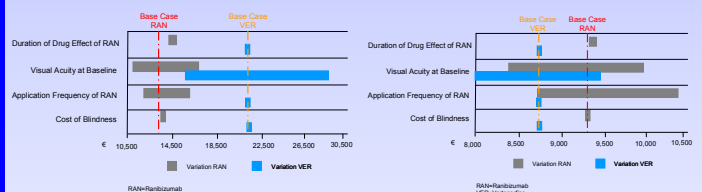
Fig. 2: Probabilistic Sensitivity Analysis



Source: IPF own calculations

The probabilistic as well as the deterministic sensitivity analyses show the robustness of the model.

Fig. 3: Deterministic Sensitivity Analysis



Source: IPF own calculations

## Conclusion

The study suggests that in Austria, the treatment of age-related macular degeneration is more cost-effective with Ranibizumab than with Verteporfin.

## References

AKH Consilium. Augenerkrankungen, 2007  
 Novartis. Was ist Makuladegeneration? [www.usstudy.at](http://www.usstudy.at), Zugriff: Februar 2007  
 Zawinka C, Ergun E, Stur M. Prevalence of Patients presenting with neovascular age-related Macular Degeneration in an urban Population. in: The Journal of Retinal and Vitreous Diseases 25(3), 2005  
 Reuter P. Springer Lexikon Medizin, Springer Berlin, 2004  
 Novartis. Global Product Value Dossier, 2006  
 Bartz-Schmidt U, Bertram B, Birngruber R, et al. Stellungnahme zu aktuellen therapeutischen Möglichkeiten bei der neovaskulären altersabhängigen Makuladegeneration. in: Klinisches Monatsblatt Augenheilkunde 223, 2006  
 Fachinformation Lucentis®. [www.ami-info.at](http://www.ami-info.at), 2007  
 OeOG, Österreichische Ophthalmologische Gesellschaft. Die altersbedingte Makuladegeneration („Netzhautverkalkung“). [www.augen-althemnet/makuladegeneration.html](http://www.augen-althemnet/makuladegeneration.html), 2007  
 Moeremans K, Annemans L. Economic Evaluation of Lucentis versus competitor treatments based on a clinical Trial Data. IMS Study Report, 2006  
 Brown D, Kaiser P, Michaels M, et al. Ranibizumab versus Verteporfin for Neovascular Age-Related Macular Degeneration (ANCHOR). in: The New England Journal for Medicine 355(14), 2006  
 Rosenfeld P, Brown D, Heier J, et al. Ranibizumab for Neovascular Age-Related Macular Degeneration (MARINA). in: The New England Journal for Medicine 355(14), 2006  
 Novartis FVF3192g (PIER) Clinical Trial – unpublished [some data published in scientific discussion EPAR], 2006  
 Walter E. Österreichische Guidelines zur gesundheitsökonomischen Evaluation. in: PharmacoEconomics – German Research Articles 4(2): 55-63, 2006  
 Statistik Austria. Sterbetafel für Österreich 2000/02. [www.statistik.at/fachbereich/03/ST/2000\\_2002.xls](http://www.statistik.at/fachbereich/03/ST/2000_2002.xls), 2002  
 Zhou S, Javitt J, Shah S, et al. Evaluating the risk of mortality for exudative(wet) AMD patients compared to a control group. Investigative Ophthalmology and Visual Sciences 47, E-Abstract 2213.2006  
 Schmidl H, Racine A, Looby M. Drug and disease model for treatment of age-related macular degeneration (AMD) with Ranibizumab, and simulation of the impact of the dosing schedule considered in the proposed label, 2006  
 Meads C, Hyde C. What is the cost of blindness? British Journal of Ophthalmology 2003 Oct; 87(10):1201-4  
 Warenverzeichnis 1. österreichischer Apothekerverlag, Februar 2007  
 Wiener Gebietskrankenkasse (WGKK): Tarife für Vertragsärzte, 2006  
 Oberösterreichische Gebietskrankenkasse (OÖGKK): Arbeitsbehelf Honorarordnung für Ärzte für Allgemeinmedizin und Fachärzte, 2004  
 Steiermärkische Gebietskrankenkasse (STGKK): Satzung 2003 der Steiermärkischen Gebietskrankenkasse, 2003  
 Tiroler Gebietskrankenkasse (TGKK): Honorarordnung für Ärzte für Allgemeinmedizin und Fachärzte, 2004  
 NÖGUS. Niederösterreichischer Gesundheits- und Sozialfonds. Ambulanzkatalog, 2001  
 BMFG (Bundesministerium für Gesundheit und Frauen). LKF. Leistungsorientierte Krankenhausfinanzierung, Modell 2007