clinical care (doctor-patient relationship, competence of nursing staff, etc.); 2) Satisfaction with physical surroundings (medical facilities, organisational structure, etc.); 3) Satisfaction with clinical outcomes (result of treatment, impairment due to side effects, etc.) In the focus groups patients reported that analgesics and their application forms have an impact on acceptance, compliance, and on several areas of life such as sleep and life style. **CONCLUSIONS:** The results of the focus groups support the assumption, that at least one further dimension of patient's satisfaction exists: satisfaction with medical treatment. This aspect has not yet been taken up by theoretical or empirical research. Due to this, world wide there is no instrument for recording this dimension today. The need to develop a new questionnaire to establish patients level of acceptance and satisfaction with their medication was specified and suggestions for a 4-dimensional model of patient's satisfaction were made.

PMD4

WHEN CAN MISSING DATA BE CONSIDERED MISSING AT RANDOM (MAR) IN SUBSTANCE ABUSE TREATMENT OUTCOMES RESEARCH?

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OBJECTIVES: A lot of attention is focused on the outcome effectiveness of substance abuse treatment. The usual method of assessing outcomes is by contacting clients after treatment and querying them on recovery-related behaviors and on drug/alcohol use. Since researchers are not always able to contact every client after treatment, the issue of response bias is important. Missing data is MAR, and thus ignorable, if differences between respondents and nonrespondents can be characterized by variables that are measured for both groups. The objective of this research is to illuminate this issue by using data collected from a U.S. treatment population and to discuss statistical methods for correcting response bias. **METHODS:** The data were collected from treatment records and follow-up interviews of clients completing substance abuse treatment at a facility in the U.S. Appropriate consent was obtained. Each client contacted was administered a questionnaire. Eighty-eight (44.9%) completed the questionnaire; 102 (52.4%) could not be contacted. Since the treatment records for the responders and nonresponders were available, information was extracted on variables related to treatment outcomes so that statistical analysis could be conducted. **RESULTS:** No differences were found between responders and nonresponders for most variables. Variables measuring demographics, family support/structure, criminality/truancy, psychological comorbidities, treatment attributes, and drug use were not different. Variables with statistically significant differences were: "number of months at current residence" ($t = 2.12$ $p = .037$) and the proportion "holding jobs" (difference in proportions = .182; 95% CI = .043 to .321). **CONCLUSIONS:** Missing data are not MAR, and thus not ignorable, when missing variables are the same as or related to variables that determine outcomes. In this case "number of months at current residence" and "holding a job" may predict treatment success. If this is true, some method of control must be used. Weighting adjustments such as post-stratification and likelihood-based methods are considered. Since the variables that predict treatment outcomes are not fully understood, it is difficult to be certain MAR criteria are met.

METHODOLOGY ISSUES—Economic Study Issues

PMD5

VALUATION OF NEW DRUG APPLICATIONS OF PHARMACEUTICAL COMPANIES USING COMPOUND OPTION MODELS

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OBJECTIVES: This paper presents a model based on real option analysis for the valuation of R&D in the pharmaceutical sector both for start-up ventures as well as big conglomerates. We derive a formal compound option model to value New Drug Applications (NDA) and show the valuable contribution of real option analysis compared to conventional DCF-analysis. **METHODS:** The key understanding is that R&D projects of NDAs can be seen as compound options. The growth option framework looks at pharmaceutical investment projects as a sequence of options, which differs from a conventional DCF-analysis by incorporating the possibility to stop the project when a subsequent phase is not valuable (abandon the option), and only continues with the project (exercising the option) when it is valuable. Traditional valuation techniques as DCF-analysis fail in valuing innovative companies because most of the value of R&D projects is embedded in unexercised real options whose future value is uncertain at this moment. If one considers a company as a portfolio of real options, one can value the projects or the company based on a compound option model. **RESULTS:** The compound option model reveals that real option analysis can better incorporate the value of a NDA than conventional DCF-analysis would reveal. Real option analysis will better reflect the fundamental value of the project or of the company, which cannot be captured by DCF-analysis. **CONCLUSION:** The paper presents a new methodology for valuing R&D of pharmaceutical companies based on compound option models.

PMD6

MODIFYING COST-EFFECTIVENESS RATIOS TO BE MAXIMALLY COMPARABLE ACROSS MULTIPLE DISEASES: AN APPLICATION OF MANIFOLD THEORY

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OBJECTIVE: Develop methodology to create a more globally informative, CE-based "valuation" that is useful