cens about safety and impact on patient outcomes. Attitudes about the proliferation of messages they perceive as “false-positives” could explain the inconsistency among pharmacist responses to drug interaction messages (DIMs). Our objective is to report a pilot study examining pharmacist utilization and perceptions of DIMs.

**METHODS:** A semi-structured telephone interview protocol was developed using Likert scales assessing pharmacists’ utilization and attitudes regarding DIMs. Utilization measures included perception of false positive DIMs and desensitization to DIMs. Attitude assessments included confidence, usefulness, and satisfaction with the drug interaction programs, and influence of liability concerns. A convenience sample of 44 West Virginia pharmacists responded during March 2002. ANOVA was used to analyze relationships among variables in this descriptive study. **RESULTS:** Among respondents, 36.4% perceived that 21–30% of DIMs were insignificant; 13.5% perceived that >50% of DIMs were insignificant. Using a 5-point scale (1 = not at all, 5 = very much), pharmacists reported desensitization to DIMs (median = 4.0). Pharmacists perceiving DIMs as more insignificant also reported greater desensitization to DIMs (F = 3.04, p < .05). Pharmacists found the programs useful (median = 4.0), were somewhat confident (median = 3.5) or satisfied with the programs (median = 3.0). Those who found the program more useful (F = 6.38, p < .05), or were more confident (F = 3.09, p < .05) or satisfied with the program (F = 6.95, p < .05), were significantly less desensitized to DIMs. Also, the more desensitized to DIMs, the more the pharmacist was influenced by liability concerns in deciding to report a DIM to the patient and/or physician (F = 4.54, p < .01). **CONCLUSIONS:** These pilot results suggest further research is warranted. Pharmacist utilization of drug interaction programs is inconsistent; this may be influenced by attitudes towards DIMs. Information regarding attitudinal barriers can provide content for pharmacist training or for vendor development of drug interaction programs.

**PHP23**

**PRESCRIBING INCENTIVE SCHEMES: DO THEY GIVE APPROPRIATE INCENTIVES FOR COST-EFFECTIVE PRESCRIBING?**

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**OBJECTIVES:** The objective of this study was to assess whether prescribing incentive schemes offered to general practitioners in England give appropriate incentives for cost-effective prescribing. METHODS: Prescribing advisers from primary care trusts (PCTs) in England were surveyed and asked to provide a copy of their prescribing incentive scheme, if available. The schemes were then analysed in order to assess the types of incentives offered, the targets (budgetary and non-budgetary) set and the therapeutic areas covered. **RESULTS:** Responses were obtained from 161 (50.4%) of the 319 PCTs existing in England in 2002. Of those responding, 109 supplied copies of their prescribing incentive scheme, others stated that their scheme was not finalized (N = 34), or offered other reasons why it could not be supplied, such as confidentiality concerns, or that no scheme was under development. Of the schemes analysed, 26% offered the maximum annual incentive of £45,000 per practice. However, many offered incentives much lower than this.
amount. The achievement of budgetary targets was a qualifying (i.e., mandatory) criterion for incentive payments in 59% of PCTs, but considerable discretion was available. The therapeutic targets generally made sense and included the promotion of generics and the encouragement of appropriate prescribing of drugs that are widely used (e.g., antibacterials). The schemes also embodied different ways of assessing whether targets were achieved, some using an “all or nothing” assessment, others using a points system relating to the extent to which various targets were achieved. CONCLUSIONS: Prescribing incentive schemes currently used by PCTs in England offer modest financial incentives to GPs. Although the selection of prescribing targets generally makes sense, the qualifying criteria and methods of assessing target achievement are quite variable and nonspecific. Whilst not providing strong incentives to GPs, they may make a contribution by signaling to prescribers which elements of prescribing are important.

PHP24

**GENERIC COMPETITION IN THE PHARMACEUTICAL INDUSTRY**

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OBJECTIVES: Generic competition has intensified in the U.S. prescription drug industry. We seek to understand the process of generic competition by developing a model for the determinants of generic entry, prices, and generics’ market share. METHODS: We develop a simultaneous equation estimation framework to examine the interaction among generic entry, prices, and market shares. The model is estimated on a panel data sample containing 40 brand name drugs that faced first generic competition during the period July 1992 through January 1998. The data period for each drug spans 36 months before and 36 months after generic entry. We use appropriate estimation method for panel data. RESULTS: We find that: 1) generic entry is positively related to pre-entry market size of the brand, but negatively influenced by the number and the market share of the generic incumbents, and the presence of entry-restricting conditions; 2) generics’ share is influenced positively by the number of generics and HMO coverage rate, but negatively by the generic-to-brand price ratio and the presence of entry-restricting conditions; 3) the generic-to-brand price ratio is larger in cases where entry-restricting conditions exist, but smaller where there are more generic competitors or where generics’ share is larger. Additionally, the generic-to-brand price ratio is lower for blockbuster drugs; and 4) on average, brand prices respond to generic entry—the inflation-adjusted rate of brand price change is found to be significantly lower after generic entry. Finally, we demonstrate the accuracy of our estimation model by predicting the out-of-sample experience of the drug Prozac (fluoxetine). CONCLUSIONS: Generic share influences and is influenced by price, while the number of generic entrants is a key determinant of generic share and generic-to-brand price ratio. Generic competition is found to be particularly intense for blockbuster drugs, which experience significantly more generic entrants, price erosion and generic penetration than other drugs.

PHP25

**DOES THE PAST PREDICT THE FUTURE?**

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Historical drug sales data are frequently used for formulary budget impact analyses of new pharmaceuticals. Growth projections are either empirical or based on simple linear regression calculations. Recent evidence indicates that the aggregate life cycle of pharmaceuticals approximates an “inverted U” distribution, however information about life cycle by therapeutic category is not available. OBJECTIVES: Determine functional data form to guide statistical modeling of the sales life cycle of pharmaceutical products, by therapeutic category. METHODS: Pharmaceutical sales data for 1992 to 2001 were obtained from IMS Canada and classified as to type (prescription, over the counter, diagnostic); formulation (tablets/capsules, injectable); release mechanism (regular, extended/sustained); compounding (single, multiple active drugs); research origin (branded, generic) and therapeutic category. Records meeting the following criteria were included in the initial analysis: prescription, branded, tablets/capsules, and single compounds. Using the date of first sale, the number of months on the market was calculated for each compound by calendar year. Sales data were adjusted for inflation using the Canadian consumer price index (1992 = 1.00) and expressed per 1000 population (2001 Canadian census). Detailed IMS therapeutic categories were consolidated into 59 categories. Linear regression and graphical examination focused on the ten top selling categories. RESULTS: For all drugs, linear regression explained only 3% of the variance in yearly sales and showed no significant difference by release mechanism. Graphical examination revealed two consistent trends: 1) A sharp rise in sales peaking at approximately 100 months followed by a slow decay and 2) three patterns of sales: a) 2–5 “super sellers”; b) 6–10 “above average sellers”; and c) the majority being average sellers. CONCLUSIONS: Drug sales are non-linear over time and are characterized by three distinct patterns. Future models will utilize non-linear techniques and incorporate number of branded compounds, number and timing of generic compounds and market share.