pital beds changed significantly in 2007 and 2011. The aim of our study is to assess the efficiency of the long-term care system in Hungary, to examine the effect of these regulations. **METHODS:** We used input-oriented Data Envelopment Analysis to calculate technical- and scale efficiency. We chose five variables: number of beds, average length of stay (inputs), number of discharged patients, amount of fee paid by the NHIF, and the number of days (outputs). We examined years 2006 (N=109), 2010 (N=121) and 2013 (N=111). Units operating with less than 50 bed were excluded. Data were collected from databases of the Hungarian National Health Insurance Fund. For our calculations we used the DEAP 2.1. **RESULTS:** In these years all of the selected variables were increasing, except the average length of stay. Technical efficiency was 94.2% in 2006, 88.6% in 2010 and 95.1% in 2013. Scale efficiency was 91.4% in 2006, 90.9% in 2010, 92.7% in 2013. Ratio of technically efficient units: 24.8% of units were fully efficient in 2006 (n=27), 19.8% (n=24) in 2010, and 35.1% (n=39) in 2013. The ratio of units achieved 100% scale efficiency was 12.8% (n=14), 5.8% (n=7) and 17.1% (n=19). Almost all units were "increasing return to scale", which means they could increase their level of efficiency, if they had larger size (more beds). **CONCLUSIONS:** Based on the results we can say that the units have relatively high values in all years. Efficiency scores decreased slightly in 2006-2010, but showed improvement in the next three years. We can conclude that the Hungarian long-term care needs to reduce the number of units, but needs to improve the size of them.

PHP79

THE COMPETITION BETWEEN DRUGSTORE AND PRIMARY CARE AND TREATMENT CHOICE OF PATIENTS IN THE CONTEXT OF ESSENTIAL MEDICINE POLICY IN RURAL CHINA

Zuo G

Shandong University, Jinan, China

OBJECTIVES: Since 2009, Chinese government has constructed essential medicines policy of centralized purchasing, uniform distribution, compulsory use and "zero-mark-up" (i.e. no-profit) sale for essential medicines in primary care, but the policy does not regulate the drugstore. As a result, competition relationship between drugstore and primary care has changed in rural China. This study aims to investigate the competition relationship between drugstore and primary care in rural China. **METHODS:** We collect information of treatment procedure of 1015 patients from 18 villages at three counties of Shandong Province in China with different economic and geographical environment from January to May 2015 by the household investigation, supported by National Natural Science Foundation of China [Grant Number 71203124]. Competition relationship between drugstore and primary care is measured as growth rate of the number of drugstore and primary care. The indicator of patients' treatment choice is proportion rate of purchasing pharmaceuticals channel. The relationship between competition relationship and patients' choice is identified by interviews with stakeholders such as the leader of County Health Bureau and primary care. **RESULTS:** From 2010 to 2014, the number of drugstore in poorest and richest County has increased respectively 2.43 times and 0.18 times. However, the number of primary care keeps unchanged. At the same time, the treatment choice of patients including village clinic(46.31%), drugstore(22.17%), county hospitals(7.49%), township hospitals(6.60%) and other hospitals(17.44%) . Drugstore has become the second biggest pharmaceuticals sale channel in rural china. The reason for this issue is the limit of only using essential medicines by no-profit sale for primary care but not for drugstore. **CONCLUSIONS:** Essential medicine policy has changed the competition relationship of pharmaceutical market in rural China, which affects treatment choice of patients. The treatment choice of patients is threatening the development of essential medicine in rural China. Keywords: essential medicine; competition; drugstore; primary care

HEALTH CARE USE & POLICY STUDIES – Formulary Development

PHP80

THE UNITED STATES SPECIALTY PHARMACY PAYOR LANDSCAPE

Brook RA[1], Smeeding JE[1], Sax MJ[2]

[1]*The TPG-NPRT, Glastonbury, CT, USA*, [2]*The Pharmacy Group (TPG), Glastonbury, CT, USA*

OBJECTIVES: Determine how medical and pharmacy directors (MDs+PDs) of US health plans, insurers, and PBMs manage specialty pharmaceuticals (SPs). In 2014 SPs accounted for one-third of spending, up from 23% in 2009. **METHODS:** Managed care (MC) MDs+PDs from public and private plans covering multiple types of members completed an online interactive survey of: advisor+plan information; use of specialty-pharmacies, and current/future coverage of SPs. **RESULTS:** Fifty-four percent of respondents were MDs, the remainder mostly pharmacists. Most worked for a health plan (83.6%) and the plans were: 39.6%=local; 35.4%=National; 25.0%=regional. SP providers were restricted by 53.7% of the plans, of those with restrictions: the majority restrict SP provider services to a small set under contract (63.0%), 17.4% allow any SP; and 6.5% only restricted products available through multiple specialty-pharmacies. Plans covered clinician-administered products (injections/infusions) under the medical-benefit (MB=67.3%); none exclusively under the pharmacy-benefit (PB=0%); and 32.7% based on cost-thresholds. Most plans (72.9%) do not anticipate a change, 18.8% expect a change before 12-2016 and 2.1% prior to 12-2018. Oral Biologics (OBs) were managed under the PB 78.3%; 10.9% under the MB; the other 10.9% based on cost-thresholds. Benefits for OBs are not expected to change by 71.1% of the plans, 11.1% were currently making changes; 13.3% expect changes prior to 12-2016; and 4.4% before 12-2018. SP and OB co-pays vary by group and benefit design and are shifting from fixed to percent co-pays. Responses to open ended questions placed SP products at the top causes for concern currently, and for the coming years. **CONCLUSIONS:** Expenditures for SP products and the use of specialty pharmacy will continue to grow. The environment for MC is undergoing a series of changes, and payor medical directors and pharmacy directors, who commonly serve as P&T Committee members will guide how changes to benefit and plan design are implemented in the future.

PHP81

ORGANS-ON-CHIPS: EXPLORING THE UTILITY OF BIOSYNTHESISED ORGAN TISSUE TO IMPROVE EFFICIENCY OF THE DRUG DEVELOPMENT PROCESS

Middelkamp H, Stamatialis D, Jzerman MJ

University of Twente, Enschede, The Netherlands

OBJECTIVES: Drug development is an expensive process, partly because of the required testing for human toxicity and efficacy of drugs. Organ-on-a-chip is a multichannel 3D microfluidic cell culture chip that simulates the activities and mechanics of entire organs and organ systems. Organ-on-chip is expected to reduce the amount of animal testing, and may increase efficiency of drug development. For instance, when organ-on-a-chip is used to replace or add to in vivo testing experiments, 7.5-10% of drug development costs may be saved. This study explores the expected advantages of organ-on-chip technologies as well as potential barriers to implement. **METHODS:** Stakeholders (n=50) in this research were employees of pharmaceutical companies (n=18, 36%), developers of microfluidic systems and university employees affiliated with organ-on-a-chip/ microfluidic systems development and/or drug development (n=22, 44%). Stakeholders were asked their expert opinions about the potential benefits of organ-on-chip using a survey (LimeSurvey), which was based on information previously acquired from expert interviews. **RESULTS:** According to stakeholders, organ-on-a-chip may be most promising in basic research stage (90%) or the preclinical stage (88%) of drug development. Simple models can be used for target identification (70%) while complex models could lead to replacement of animals (78%). However, head-to-head studies are needed to change regulations, leaving organ-on-a-chip as an add-on in drug development for now. There are significant differences between stakeholders opinions about advantages. Most promising organ-on-chip developments should target organs like Liver (20%), heart (18%) and kidney (17%). **CONCLUSIONS:** Organ-on-a-chip can be a valuable add-on in the drug development process, in particular in basic research or preclinical stage of the drug development process. Given the very early stage of organ-on-chip technologies, it is hard to predict return on investment.

PHP82

THE CURRENT LANDSCAPE AND EXPECTED CHANGES IN FORMULARY MANAGEMENT

Brook RA[1], Smeeding JE[1], Sax MJ[2]

[1]*The TPG-NPRT, Glastonbury, CT, USA*, [2]*The Pharmacy Group (TPG), Glastonbury, CT, USA*

OBJECTIVES: Understand how medical and pharmacy directors (MDs+PDs) and pharmacy and therapeutics (P&T) committees from public and private health plans, insurers, and PBMs administer formularies, make formulary decisions today, and expected changes for the future. **METHODS:** Online interactive survey of US MDs+PDs. **RESULTS:** Fifty-four percent of respondents were MDs, the remainder mostly pharmacists. Most worked for a health plan (83.6%) and 39.6% of the plans were local; 35.4% national; and 25.0% regional and 86% were involved in formulary decisions. AMCP-dossiers are: not-required (52.2%), used for back-ups (39.1%) and used as a basis for reviews (8.9%). Clinician-administered products (ex. office administered injections) are always under the medical-benefit (67.3%), no plans exclusively under the pharmacy-benefit, the remaining 32.7% determine the benefit using cost-thresholds; most plans (72.9%) do not anticipate a change, 18.8% expect a change before 12-2016, 2.1% before 12-2018. Mental health (MH) products were carved-out in 1/3 of plans, conditions with multiple MH therapies required generics first (45%), mandatory step-therapy (37.5%) and require care by a psychiatrist (17.5%). Most were happy with their pharmacy-benefit design, the most requested changes were more restrictive management programs; followed by changes in tiers/co-pays. Most respondent didn't desire a change to their P&T process; desired changes included more frequent meetings/time; and the use of Comparative Effectiveness Research. Most advisors happy with their plan's medical-benefit management, the most desired changes included integration of benefits/departments and more restrictive networks. Top current medical concerns: Cancer/oncology, Diabetes and Hepatitis-C. Top current budget concerns Hepatitis-C, Cancer/oncology, and Diabetes. Future areas of concern include biosimilars, immunomodulators, cardiovascular/heart disease; multiple sclerosis; biologics; orphan/rare diseases. **CONCLUSIONS:** Managed care uses a variety to tools for formulary managment, including benefit type, mandatory generics and step-therapy. Understanding how decisions are made today and concerns for today and in the future can help guide product development.

PHP83

PHARMACY INFORMATION SYSTEM IN SAUDI HOSPITALS- HOW FAR IS IT TO MEET PHARMACY BENEFIT MANAGEMENT PROGRAM REQUIERMENTS?

Alkelya M[1], Alsultan M[2], Alenezi M[2], AlJeraisy M[3]

[1]*King Abdullah International Medical Research Center (KAIMRC), Riyadh, Saudi Arabia*, [2]*King Saud University, Riyadh, Saudi Arabia*, [3]*King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh, Saudi Arabia*

OBJECTIVES: Pharmacy Information System (PIS) in hospital pharmacies can optimize the institutional Pharmacy Benefit Management Program (PBMP) and patients' outcomes if the PIS has high detection and reporting capabilities. The aim of the study is to explore and investigate the PIS capabilities in tertiary and secondary hospitals in Riyadh city, Saudi Arabia. **METHODS:** A cross-sectional survey targeted pharmacy mangers in hospital with inpatient and outpatient pharmacies in Riyadh City in 2014. The survey gathered information about PIS characteristics such as detection capabilities (drug interactions, drug allergy, etc.), drug utilization reporting capabilities, and PIS integration with Electronic Medical Record (EMR) Computerized Physician Ordered Entry (CPOE). **RESULTS:** Of 30 hospital pharmacies, 23 (76.6%) pharmacy managers responded, only 21(70%) hospital pharmacies met the inclusion criteria, 15 (71.4%) are governmental and 6 (28.6%) are private hospitals, 18(85.7%) hospitals have EMR, 19 (90.5%) hospital pharmacies have PIS. Of the 14(66.67%) hospitals with CPOE, only 9 (64.2%) have CPOE that are integrated with inpatient and outpatient PIS. For the PIS capabilities, out of the 21 hospitals; 8 (38.1%) were able to detect incorrect dose and duration, 7 (33.3%) for drug-drug interaction, 5(23.8%) for drug-disease Interaction, 6 (28.6%) for contraindication, 6(28.6%) for the