management intervention had no major effect on RA disease activity metrics over the 24-month follow-up. However, patients in the intervention arm reported a positive effect of the intervention. More studies are needed to further understand patient preferences for optimal RA flare management and to design interventions to meaningfully address these preferences.

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OP0310

IMPLEMENTATION OF TNF-BIOSIMILARS (INFLIXIMAB AND ETANERCEPT) IN DANISH DEPARTMENTS OF RHEUMATOLOGY

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Background: The use of expensive biological drugs in rheumatology is rapidly increasing and has led to substantial increases in drug expenditures. A considerable reduction of drug costs is possible by using biosimilars as soon as they become available and carrying out non-medical shifts to biosimilars (i.e. switching a patient well treated on a biooriginator to the biosimilar). Research on biosimilars has focused on interchangeability and safety outcomes, but little focus has been on nationwide implementation and the direct economic consequences on drug expenses.

In Denmark, TNF-inhibitors are solely given in an in-hospital setting and bought through national tenders. The Danish in-hospital organization includes Regional Drug and Therapeutics Committees that ensures regional implementation of treatment guidelines and close collaboration between hospital pharmacies and regional clinical pharmacologists. Furthermore, the implementation of TNF-inhibitor biosimilars was preceded by careful preparations from among others a newly established national biosimilar task force.

Objectives: The aim of this study was to describe the implementation of the two first TNF-inhibitor biosimilars (infliximab and etanercept) in Danish departments of rheumatology.

Methods: Monthly data on drug sales to Danish rheumatology departments were used to assess the biosimilar uptake rate and subsequent changes in the drug expenditures during the implementation in Denmark.

Results: Shifts to biosimilars were begun within a few months following end of biooriginator patent, vertical lines in the figure. Use of the infliximab biosimilar was begun in April 2015, and in August 2015 biosimilar uptake was 92.9% of total infliximab use. Similarly use of etanercept biosimilar was begun in April 2016, and in June 2016 the biosimilar uptake was 91.6% of total etanercept use. In January 2015 the total use in Defined Daily Doses (DDD) were 42.4 thousand DDD's for infliximab and 37.3 thousand DDD's for etanercept. The use increased steadily and was in January 2018 138.4 thousand DDD's for infliximab and 62.1 thousand DDD's for etanercept (equivalent to increases of 226.6% and 66.8%). The increases in DDD's were not reflected in total drug costs due to the shift to biosimilars. The total drug cost for infliximab in January 2015 was 6.7 million DKK but was reduced to 5.4 million DKK in January 2018 (-19.4%). A corresponding cost reduction was seen for etanercept (11.3 million DKK in January 2015, 8.1 million DKK in January 2018, -28.7%).

Conclusion: Danish departments of rheumatology experienced a fast and near-complete switch of infliximab and etanercept biooriginators to biosimilars. At the same time the use of the drugs increased substantially, but due to large price reductions the total drug cost decreased despite the increasing use. We believe that a thorough preparation and an organizational setting supporting the implementation was crucial for the successful implementation. The Danish structure, with its national tendering, probably contributed to the substantial drug discounts obtained. The implementation will be used for future biosimilars in Denmark.

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OP0311

RETROSPECTIVE ANALYSIS OF PRESCRIPTION DYNAMICS OF ETANERCEPT AFTER INTRODUCTION OF BIOSIMILARS BASED ON NORWEGIAN PRESCRIPTION DATABASE. AN INTERIM ANALYSIS

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Background: In Norway, several high quality data registries are available that can be used to generate "real life" data. All individuals living in Norway are given a unique ID number which makes it possible to trace individuals. The Norwegian Prescription Database (NorPD) is one of the central public registers that are available for research purposes. All prescriptions being collected by individuals are recorded, including reimbursement code, dispensing date, name and dose of the prescribed drug. Following loss of exclusivity of some biologics, biosimilars are competing in the Norwegian tender.

Objectives: Both efficacy, bio-chemical features and patient satisfaction with biosimilars have been debated since they were introduced to replace originator. However, there is only sparse evidence as to how many patients were switched and how many are switched back to the originator so large, registry based studies are warranted.

Therefore, our aim was to follow all patients on originator receiving maintenance treatment (drug prescription being collected and registered in NorPD) after biosimilar entry (BE) in order to retrospectively describe the pattern of switch and monitor dynamics, assumed to be economically motivated from patients stable on originator to biosimilars or other preferred drug.

Methods: We included all patients on etanercept maintenance treatment for 9 months prior to BE with maximum gap of 4 months from previous prescription retrieval. Switch was defined as discontinuation of use for at least 4 consecutive months.

Prescription data scans from NorPD started March 2016 (BE) and data scans were performed every 3 months during the first 6 months of this project and every 6 months for 2 years. Final data extraction will be performed within July 2019. This abstract covers the interim analysis and the time period from 9 months prior to BE and 18 months thereafter.

Results: We have identified 8149 individuals on biologics prescribed in Norway. Of those, 4799 collected at least two prescriptions of etanercept before BE and are included in further analyses. The proportion of originator etanercept users declined sharply after biosimilar entry as expected for the first three months after BE and kept decreasing for the consecutive 9 months, however it changed little thereafter.

A great majority of former etanercept users was switched to SB4 (70.5%) and continued with this medication, however some switched back to etanercept or other

medication. A small proportion of individuals switched shortly to SB4 and then later to other medication. 5.7% of former etanercept users switched to other medication at the time of Switch date. For details, see Figure 1.

Many patients switched back and forth several times, also using other medication at short time intervals. The method of distribution (pen versus injection) was associated with higher odds for being switched. Patients using etanercept pen were more likely to switch to biosimilar etanercept after BE (Figure 2).

For patients who switched to SB4 the 18 months cumulative incidence of drug survival was 72%; 95%CI [65-79]%. At 2 years follow-up the drug survival in switchers will be matched with historic drug survival rate of etanercept estimated using data from NorPD.

Conclusion: The Norwegian Prescription Database is a useful tool that enables to monitor use, changes and trends in use of selected drugs. A longer follow-up is warranted in order to describe drug survival after switch from etanercept to biosimilar etanercept. However, close collaboration between pharmacists, clinicians and statisticians is warranted.

Figure 1

Figure 2

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OP0312

VARIABILITY IN BIOLOGIC PRESCRIPTION PATTERNS FOR RHEUMATOID ARTHRITIS PATIENTS IN THE AMERICAN COLLEGE OF RHEUMATOLOGY INFORMATICS SYSTEM FOR EFFECTIVENESS (RISE) REGISTRY

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Background: Biologics account for a substantial portion of drug spending in rheumatoid arthritis (RA). Variability in the U.S. in biologic prescribing patterns (and therefore variability in cost of care), and factors that correlate with that variability, remain largely undefined.

Objectives: We used data from the RISE registry to perform a cross-sectional analysis among U.S. rheumatologists of prescription patterns for biologic DMARDs and tofacitinib and their relationship to RA disease activity.

Methods: RISE is a U.S. registry that passively collects data on all patients seen by participating practices, thereby reducing selection bias present in single-insurer claims databases. As of December 2017, RISE held validated data from 1,257 providers in 236 practices, representing an estimated 25% of the U.S. clinical rheumatology workforce. We identified patients with available demographic and disease activity information who were assigned ≥ 2 codes for RA ≥ 30 days apart between January and December 2017. Practices with < 20 RA patients (15/104 practices providing all necessary data) were excluded. We tallied the proportion of patients in each practice prescribed a TNF inhibitor, abatacept, rituximab, tocilizumab, or tofacitinib at least once during 2017. Patients prescribed > 1 of these drugs were assigned to the first drug prescribed and therefore counted only once. We used a hierarchical linear model to predict the probability of receiving a prescription for a biologic based on the patient's most recent disease activity score (moderate or high disease activity vs. low disease activity or remission) and age from 2016, accounting for clustering by practice.

Results: We analyzed 53,850 patients from 104 practices. Overall, 29% of patients were prescribed a biologic DMARD or tofacitinib in 2017. TNF inhibitors were most commonly prescribed, followed by abatacept (4.5% of patients), tofacitinib (4.2%), tocilizumab (3.4%), and rituximab (2.5%). We found significant variation within practices in the proportion of patients prescribed any of these drugs (range 0%-100%). In the adjusted analysis, we found that patients with higher disease activity in 2016 were more likely to receive biologics in 2017 (OR 1.56, 95% CI (1.51, 1.62)). Within a practice, as shown in the figure, the risk-adjusted likelihood of receiving a biologic prescription still showed significant variation (between 0%-83% of patients in each practice received a biologic; model c-statistic 0.61).

Figure. Proportion of RA patients prescribed biologics or tofacitinib, aggregated by practice and adjusted for disease activity and age, for practices with at least 20 patients with RA, between January and December 2017.

Conclusion: In this large sample of U.S. rheumatology practices, higher RA disease activity correlated with the likelihood that a patient would receive a prescription for a biologic, but did not account for all of the variability in biologic prescription patterns. These results suggest that there may be other factors in addition to RA disease activity that account for practice-to-practice variability in biologic prescription patterns. Disclaimer: These data were collected from the ACR's RISE Registry; however, the views expressed represent those of the authors, not necessarily those of the ACR.

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OP0313

COST-EFFECTIVENESS OF A JAK1/JAK2-INHIBITOR VS. A BIOLOGIC DISEASE-MODIFYING ANTIRHEUMATIC DRUG IN A TREAT-TO-TARGET STRATEGY FOR RHEUMATOID ARTHRITIS

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Background: Treating Rheumatoid Arthritis (RA) to an a priori defined disease activity target (T2T) is recommended in EULAR guidelines. This involves a step-up approach in which it is first attempted to achieve the target with a combination of conventional synthetic (cs) DMARDs. Baricitinib is a JAK1/JAK2-inhibitor approved for treatment of patients suffering from RA. EULAR and ACR guidelines currently position JAK1/JAK2-inhibitors and bDMARDs at the same level in the therapeutic treatment sequence for csDMARD Inadequate Responders (IR). Cost-effectiveness assessment of different T2T strategies, especially ones