

## BACKGROUND

- Tyrosine kinase inhibitors (TKIs) effectively suppress the progression of chronic myeloid leukemia (CML)
- Previous studies have highlighted the high prices and low accessibility of TKIs
- China has conducted seven rounds of national drug price negotiation (NDPN) since 2017
- Two TKIs for CML have been listed in the National Reimbursement Drug List (NRDL) through NDPN
- Few studies provide updated evidence of the policy impact of NDPN
- Research on the spillover effects of NDPN on medications with the same indication is scarce

## METHODS

- Data sources:** medical insurance procurement data from an eastern province, 2018~2021
- Sample:** marketed first-line TKIs for chronic stage of CML in China (*Tab.1*)
- Indicators:** defined daily doses (DDDs), defined daily cost (DDC), purchase spending
- Analysis methods:**
  - descriptive statistics
  - interrupted time series (ITS) (*Fig.1*)

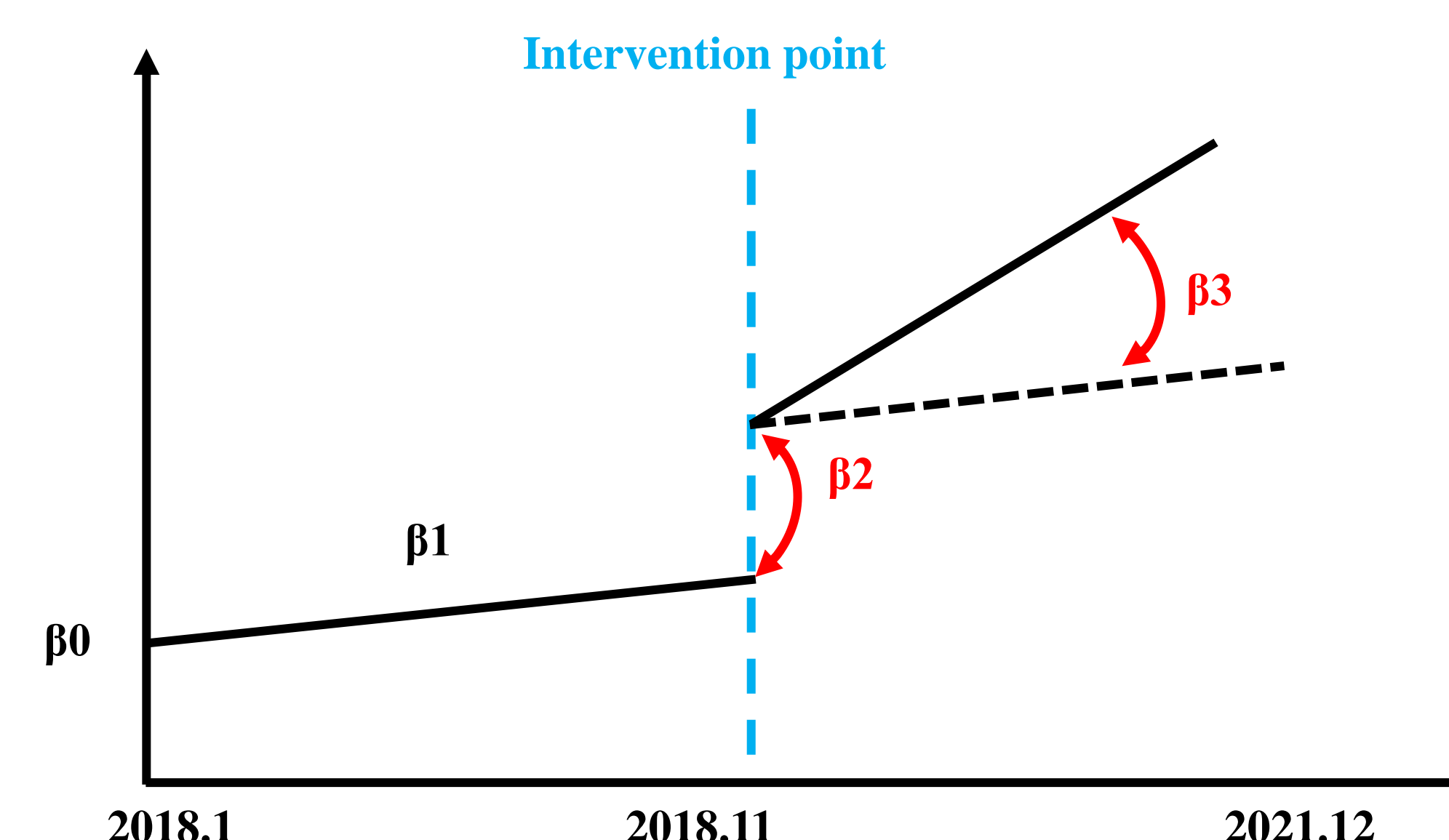
Table 1. Basic information of Sample Drugs

unmarketed    marketed  
listed in NRDL    national centralized purchase

| Drug      | Indication                 | Progress (2002 -2022) |
|-----------|----------------------------|-----------------------|
| Nilotinib | Ph+ CML, adults            | 2009 2018             |
|           | CML, children >2 years old | 2019 2021             |
| Imatinib  | Ph+ CML                    | 2002 2017 2018        |
| Dasatinib | Ph+ CML, adults            | 2011 2017             |

Figure 1. ITS Model

$$Y_t = \beta_0 + \beta_1 T_t + \beta_2 X_t + \beta_3 T_t X_t + \varepsilon_t$$



## RESULTS

### Changes after Nilotinib was listed in the NRDL through NDPN

- The DDC of Nilotinib reduced, while its monthly DDDs and purchase spending increased, changing more than Imatinib and Dasatinib (*Tab.2*)
- Nilotinib replaced other same-indication drugs (*Fig.2*)
- The total purchase volume increases, and the growth has a certain lag (*Fig.3*)
- The total purchase spending initially dropped and then grew over time (*Fig.4*)

Table 2. General Changes of Sample Drugs

| indicator/drug   | Nilotinib              | Dasatinib | Imatinib  |
|------------------|------------------------|-----------|-----------|
| DDC (CNY)        | before 717.67          | 143.66    | 248.37    |
|                  | after 253.64           | 147.74    | 111.83    |
|                  | change rate (%) -64.66 | 2.84      | -54.97    |
| monthly DDDs     | before 866.40          | 3,611.15  | 29,930.28 |
|                  | after 4,645.26         | 5,790.52  | 52,512.85 |
|                  | change rate (%) 436.16 | 60.35     | 75.45     |
| monthly spending | before 62.04           | 51.79     | 743.69    |
|                  | after 115.33           | 85.98     | 552.14    |
|                  | change rate (%) 85.91  | 66.02     | -25.76    |

Figure 2. Changes in Utilization Proportion

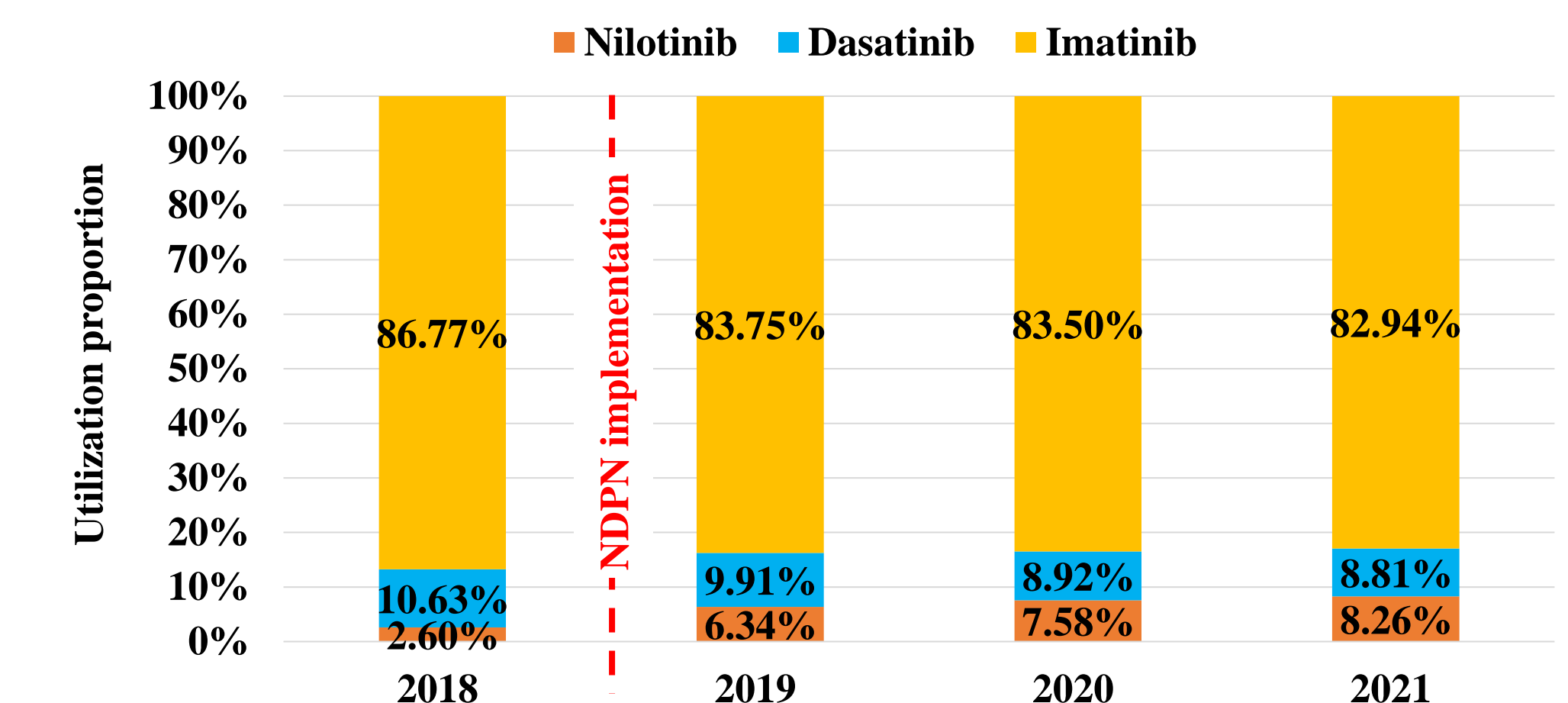


Figure 3. Changes in Purchase Volume

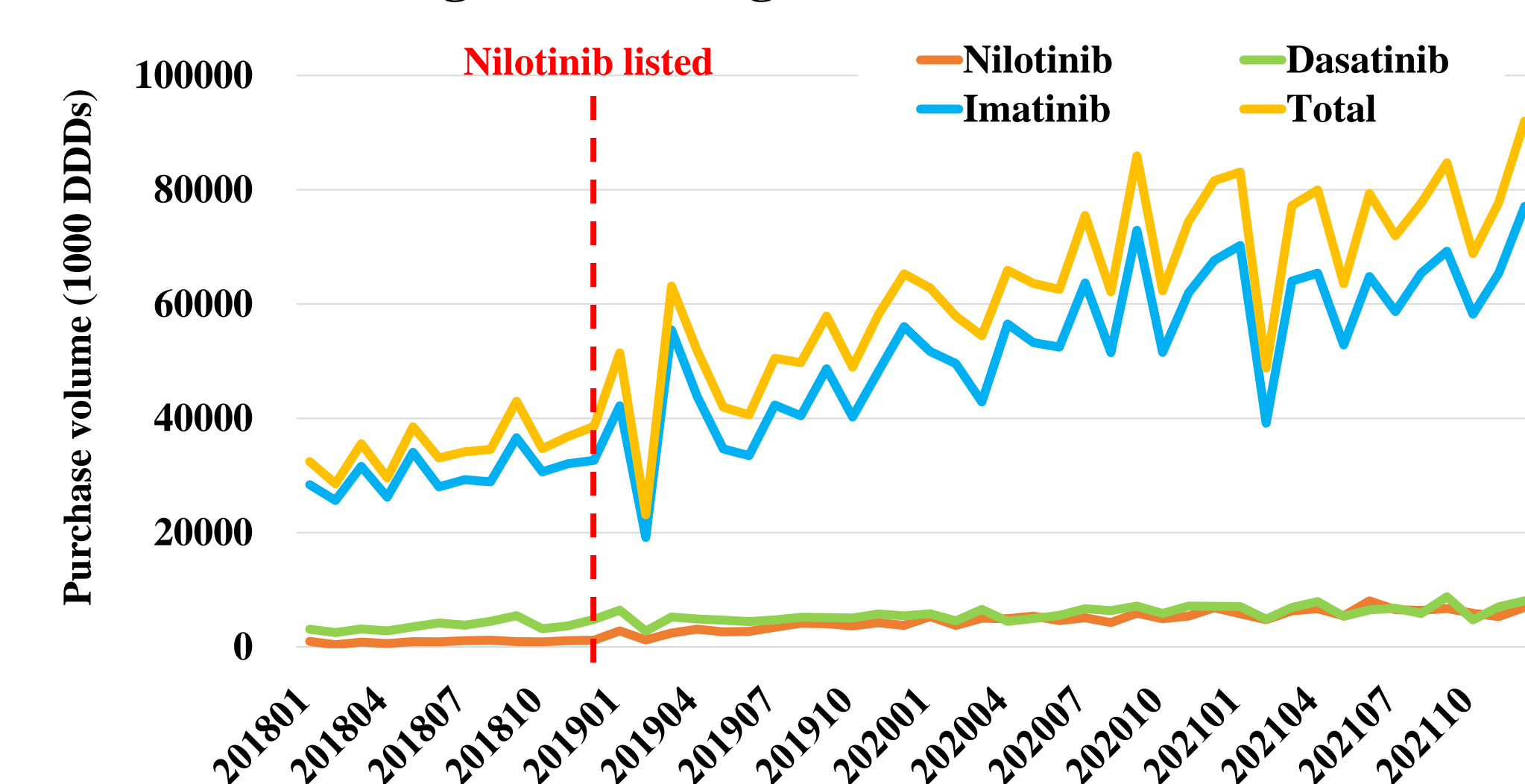
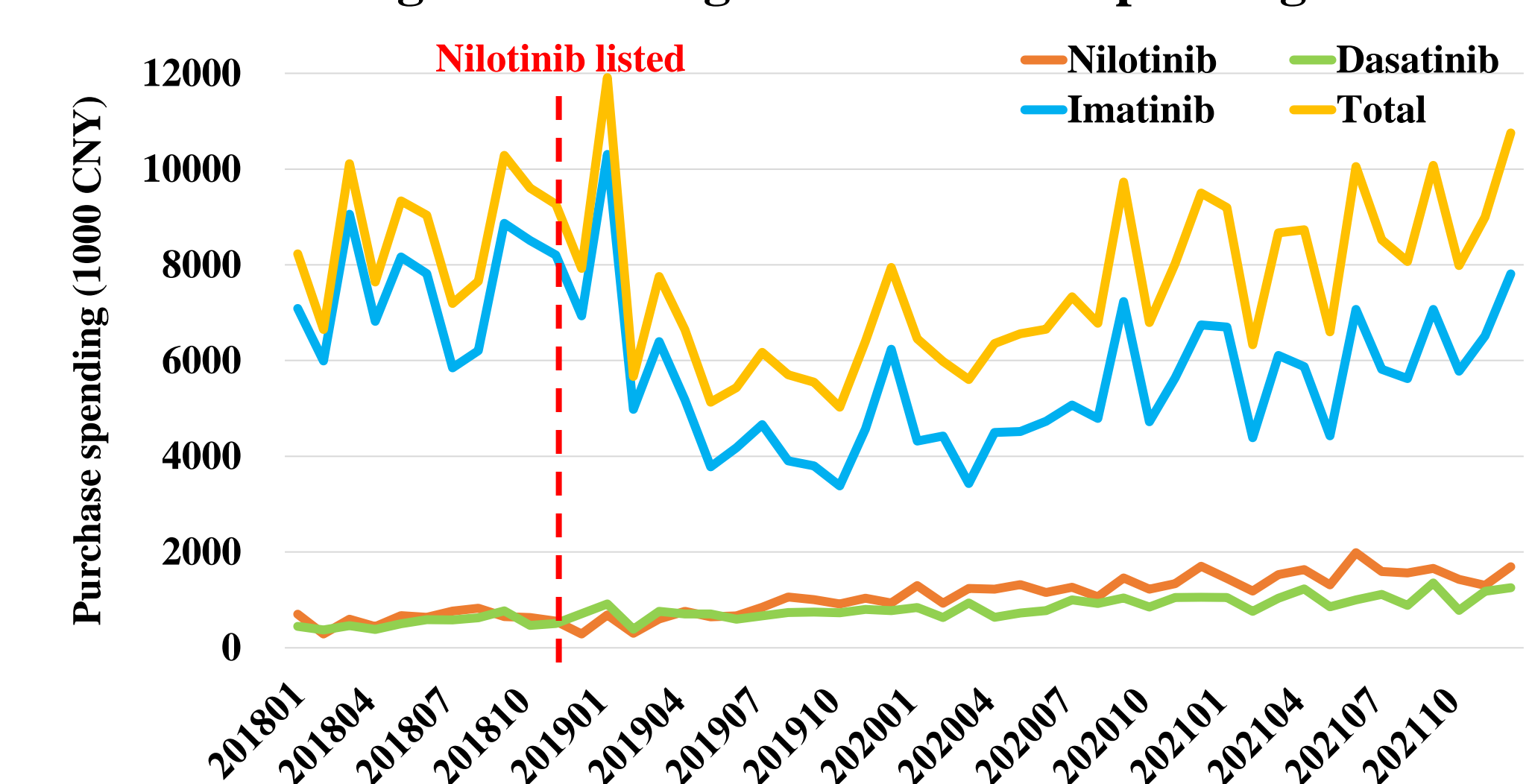


Figure 4. Changes in Purchase Spending



### ITS results

- The use of Nilotinib and Imatinib showed a significant long-term increasing trend, while the use of Dasatinib decreased (*Fig.5*)
- The spending on each individual drug declined, and the total spending on three drugs decreased significantly in the short term (*Fig.6*)

Figure 5. ITS Results of DDDs

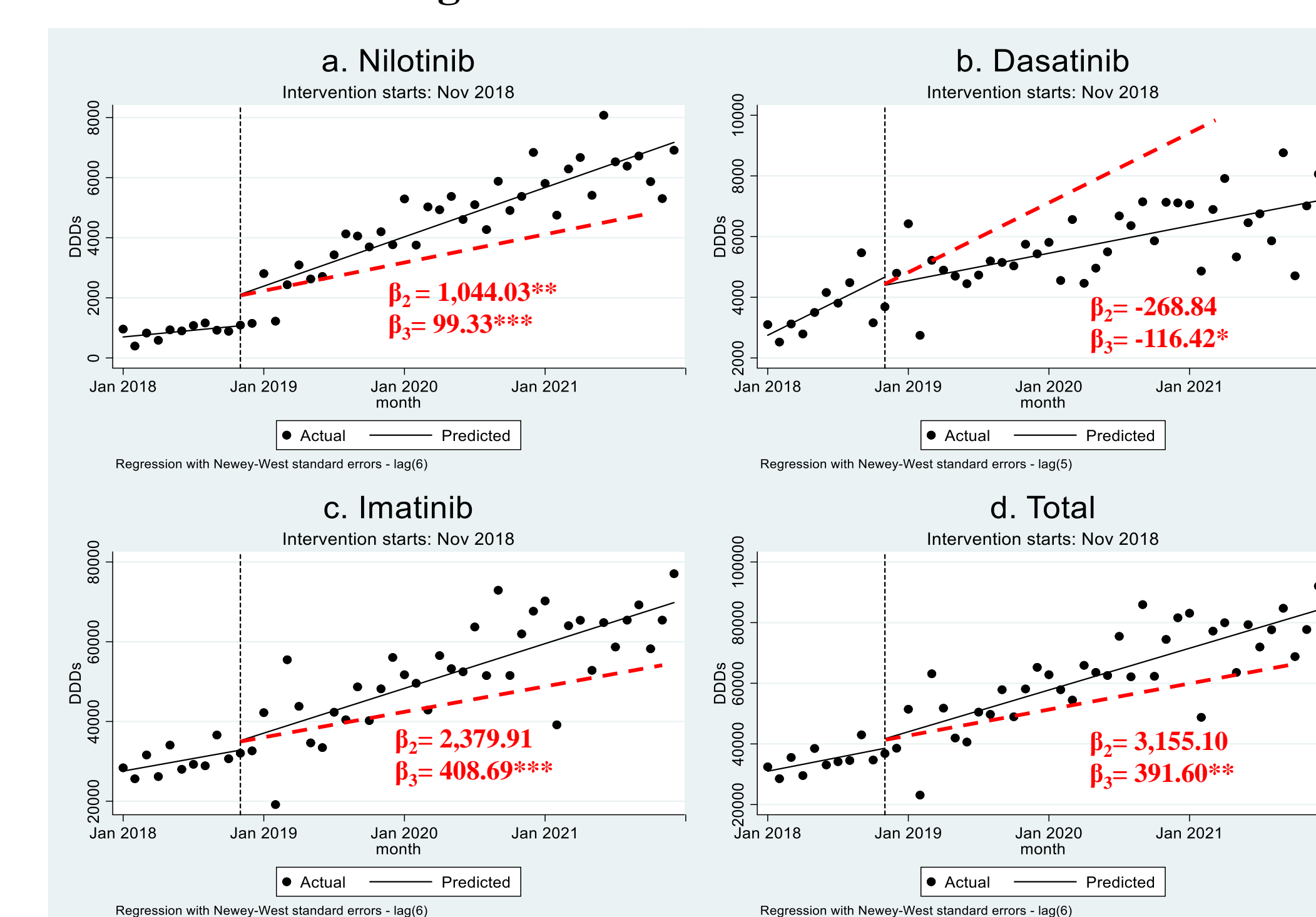
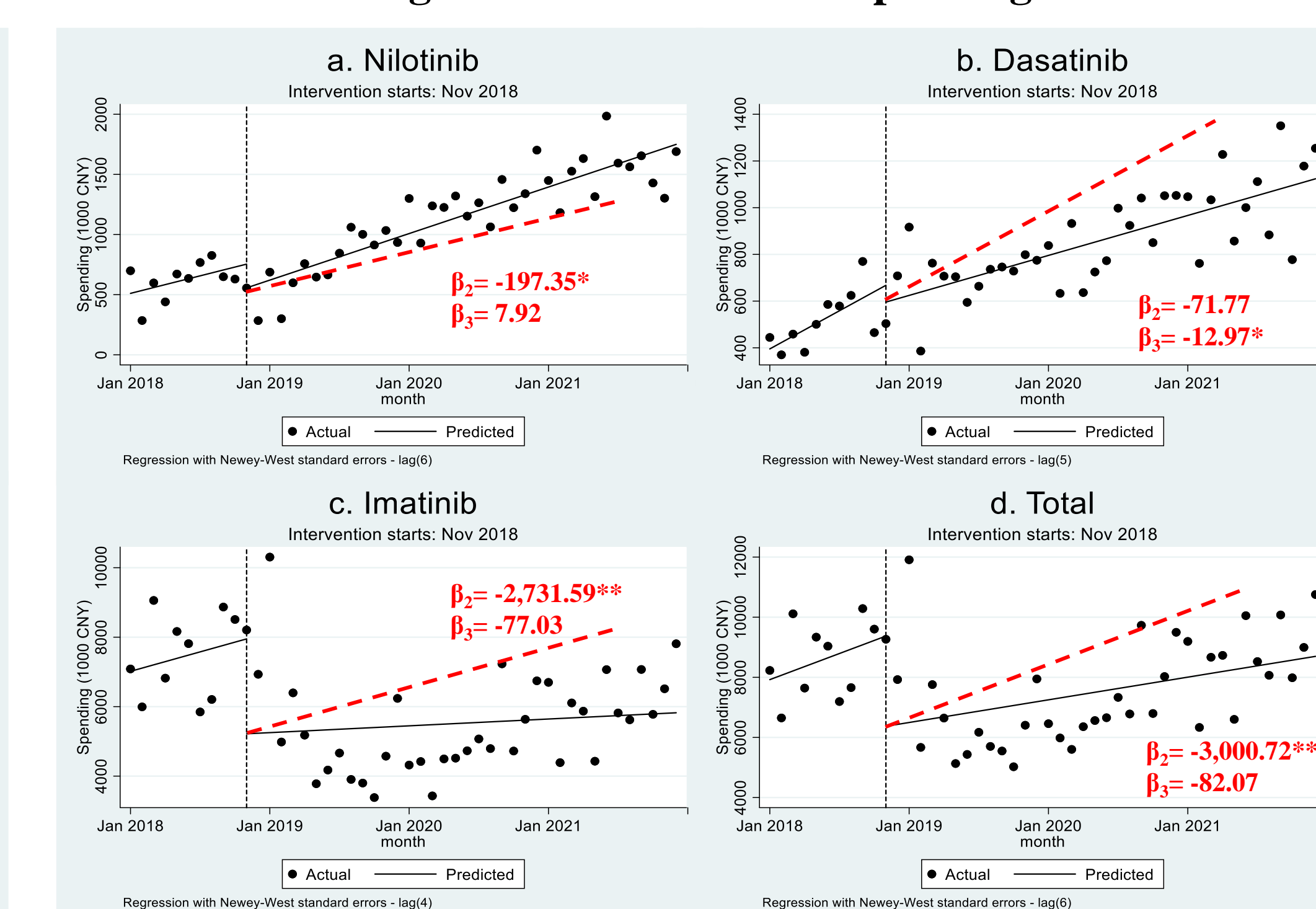


Figure 6. ITS Results of Spending



## MAIN FINDINGS

- NDPN reduces drug prices and increases purchase volume, thereby improving accessibility
- After one drug was listed in the NRDL, the total purchase volume of drugs for this disease increased, while the total spending decreased
- A nationally negotiated drug can rapidly change the utilization proportion of drugs used to treat this disease by replacing same-indication drugs

## POLICY IMPLEMENTATION

- Further implement the National Drug Pricing Negotiation and promote the availability of nationally negotiated drugs to ensure accessibility
- Appropriately guide the utilization proportion of drugs with the same indication according to clinical needs and therapeutic efficacy