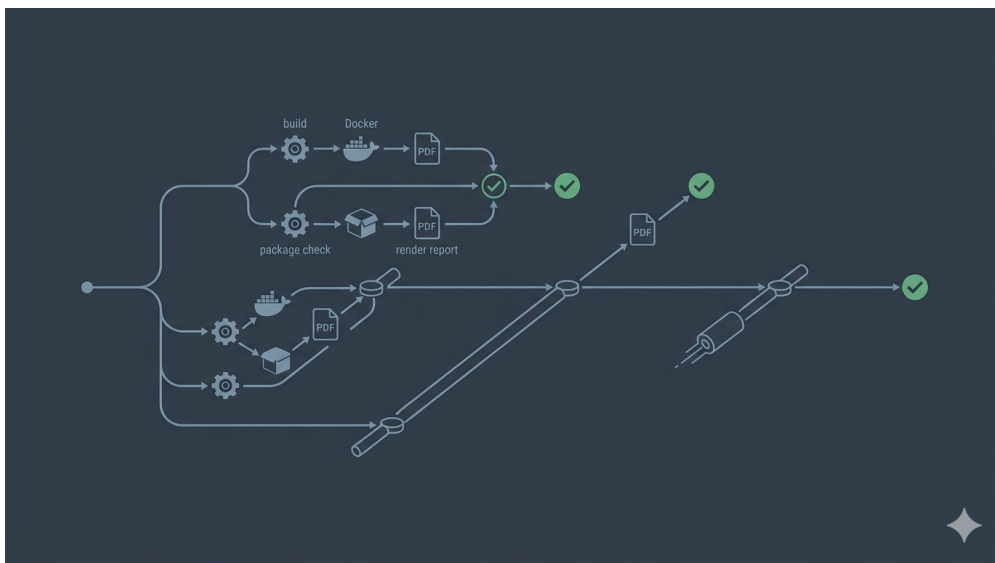


GitHub Actions workflows for zcollab research compendia

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Two workflow files, three workspace types: knowing which CI to apply is the first step toward a reproducible research pipeline.

Introduction

I did not realise that my zcollab repos had inconsistent CI until I tried to distribute a single working workflow file across 45 projects and watched the results diverge in unexpected ways. Some repos needed R CMD check. Some needed Rmd rendering. Some needed both. A few needed neither. There was no single file that was right for all of them.

The problem was not the YAML itself; it was that I had treated all zcc workspaces as equivalent. A manuscript-package compendium (an R package plus a companion Rmd report) has genuinely different CI needs from a data-analysis compendium (scripts and data, no package) or a blog-post compendium (Quarto source, no R package at all). Applying the wrong workflow to the wrong workspace type either misses real errors or runs unnecessary steps on every push.

This post maps the three workspace types to their correct workflow combinations, annotates each YAML file in detail, and documents the key configuration decisions that determine whether CI passes or fails.

Motivations

- Distributing a single workflow file across all repos exposed the fact that ‘one size fits all’ CI does not work when workspace structure varies.
- A repo running R CMD check against packages that are not declared in DESCRIPTION will fail with a cryptic ‘packages not available’ error that takes time to diagnose.
- The `RENV_CONFIG_REPOS_OVERRIDE` variable is not in the zccollab template by default, yet without it `renv` may restore from a binary repo pinned to the wrong Ubuntu release.
- Version-controlling CI alongside the compendium means every collaborator gets the same check, not just the person who happens to have the tools installed locally.
- Surveying 45 repos revealed that five were missing the `# Profile:` comment that `make r` requires, and seven were using the wrong base workflow for their workspace type.

Objectives

1. Understand the three zcc workspace types and which CI workflows each requires.
2. Deploy `r-package.yml` correctly, including the `RENV_CONFIG_REPOS_OVERRIDE` fix, in any manuscript-package or data-analysis compendium.
3. Deploy `render-report.yml` correctly in any workspace that contains `analysis/**/report.Rmd` files.
4. Verify that CI passes on GitHub Actions after deploying the correct workflow combination.



What is a zcollab workflow?

A zcollab workflow is a GitHub Actions YAML file that validates R package structure, renders manuscripts, or both, triggered automatically on every push to `main`. The two workflow files serve distinct purposes and use different execution environments by design.

`r-package.yml` runs on a bare GitHub-hosted Ubuntu runner and reads dependencies from `DESCRIPTION`. It answers the question: is this a well-formed R package with all declared dependencies resolvable? It does not test the Docker environment and does not use `renv.lock`.

`render-report.yml` builds the project's own Docker image and runs `renv::restore()` inside it before rendering manuscripts. It answers the question: does the fully pinned, containerised environment produce a rendered output? It is the CI equivalent of `make r` followed by `rmarkdown::render()`.

Keeping the two concerns separate means a package structural error (missing documentation, undeclared import) is caught by one workflow, and an environment reproducibility error (broken lockfile, Docker build failure) is caught by the other.

Prerequisites

This post assumes:

- **zzcollab version:** v2.4.0 or later (the `.zzcollab/manifest.json` marker is present).
- **GitHub:** the repo is hosted on GitHub with Actions enabled.
- **Workspace type:** the repo's workspace type (manuscript-package, data-analysis, or blog-post compendium) is known (see the decision table below).
- **renv:** an `renv.lock` file is present and up to date.
- **Dockerfile:** the repo has a Dockerfile with a `# Profile:` comment in the first 20 lines.

If the Dockerfile is missing the `# Profile:` comment, `make r` will abort with 'Could not detect profile from Dockerfile'. Add the comment before proceeding.

The Three Workspace Types

zzcollab repos fall into three structural categories. The correct CI combination follows from the category.

Workspace type	Has R package	Has analysis/**/report.Rmd	r-package.yml	render-report.yml
Manuscript-package	yes	yes	yes	yes
Data-analysis	yes	no	yes	no
Blog-post	no	no (Quarto source)	no	no

Manuscript-package (most common): an R package that implements the analysis, plus one or more `analysis/*/report.Rmd` manuscripts. Needs both workflows: `r-package.yml` checks the package, `render-report.yml` renders the manuscripts.

Data-analysis: an R package used for a self-contained analysis but without companion manuscripts. Needs `r-package.yml` only.

Blog-post (qblog compendia): a Quarto document with supporting R code but no R package structure. Neither workflow applies; Quarto rendering is handled by a separate `quarto-publish.yml` if needed.

The zzzcollab doctor (`zcc doctor`) reports `r-package.yml` as a required file for manuscript-package and data-analysis repos. It does not currently scaffold `render-report.yml` automatically.

The R CMD Check Workflow: r-package.yml

Place this file at `.github/workflows/r-package.yml`. It is the standard zzzcollab CI workflow for any repo that contains an R package.

The key architectural decision in v2.7.0 is that this workflow runs on a bare GitHub-hosted Ubuntu runner, not inside the project's Docker container. Its sole purpose is to validate R package structure: can the package be installed, do declared dependencies resolve, and do the tests pass? Exact version pinning and container reproducibility are `render-report.yml`'s responsibility, not this workflow's.

```

# zcollab r-package.yml v2.7.0
#
# Validates R package structure via R CMD check on a host runner.
# Dependencies installed from DESCRIPTION (not renv.lock); exact version
# pinning and container reproducibility are covered by render-report.yml.
#
name: R Package Check

on:
  push:
    branches: [ main, master ]
  pull_request:
    branches: [ main, master ]
    # No paths: filter here – every push triggers a package check because
    # any source change can break R CMD check. Path filtering is reserved
    # for render-report.yml, whose Docker build is expensive.

jobs:
  check:
    runs-on: ubuntu-latest
    # WHY host runner, not the project container: the zcollab .Rprofile
    # suppresses renv when ZZCOLLAB_CONTAINER=true is absent. Running on a
    # bare host runner and reading from DESCRIPTION sidesteps this entirely.
    env:
      GITHUB_PAT: ${ secrets.GITHUB_TOKEN }
      # GITHUB_TOKEN is auto-provided by Actions; exposing it as GITHUB_PAT
      # allows r-lib actions to authenticate against GitHub Package Registry
      # when resolving dependencies declared in DESCRIPTION.
      R_KEEP_PKG_SOURCE: yes
      # Retains source packages after installation so R CMD check can
      # inspect them; without this, check artefacts may be incomplete.
    steps:
      - uses: actions/checkout@v6

      - name: Install system dependencies
        run: |
          sudo apt-get update -q
          sudo apt-get install -y --no-install-recommends \
            libcurl4-openssl-dev libssl-dev libxml2-dev \
            libblas-dev liblapack-dev libnlopt-dev \
            libfontconfig1-dev libfreetype6-dev \
            libharfbuzz-dev libfribidi-dev \
            libgit2-dev cmake
          # These are the C/C++ system libraries that R packages link against
          # at compile time. They are not in DESCRIPTION; they must be
          # installed manually before setup-r-dependencies runs.

```

```

- uses: r-lib/actions/setup-pandoc@v2
  # Required for vignettes and Rmd-based documentation that calls
  # pandoc during R CMD check.

- uses: r-lib/actions/setup-r@v2
  with:
    use-public-rspm: true
  # Points R at Posit Package Manager, which serves pre-compiled
  # Linux binaries. Without this, every package compiles from
  # source, adding 10-30 minutes to the run.

- uses: r-lib/actions/setup-r-dependencies@v2
  # WHY not setup-renv: this action reads DESCRIPTION, not renv.lock.
  # Using setup-renv would call renv::restore(), which the zzzcollab
  # .Rprofile silently skips on a host runner (no ZZCOLLAB_CONTAINER).
  with:
    extra-packages: any::rcmdcheck
  # rcmdcheck is a CI tool, not a project dependency; it is absent
  # from DESCRIPTION and must be declared here explicitly.
    needs: check
  # Tells the action this is a check workflow; it installs Suggests
  # packages in addition to Imports, matching what R CMD check tests.

- uses: r-lib/actions/check-r-package@v2
  # Wraps rcmdcheck::rcmdcheck() with sensible CI defaults. Fails on
  # any ERROR or WARNING (including undocumented exported objects).
  with:
    upload-snapshots: true
  # Uploads testthat snapshots as artefacts so failures can be
  # inspected without re-running locally.

```

Why a host runner, not the project container?

Earlier zzzcollab CI templates (v2.4.0) ran R CMD check inside the project’s `rocker/tidyverse` container. This felt natural, since `make r` uses the same container for local development. The approach worked until the zzzcollab `.Rprofile` was updated to suppress `renv` activation outside the Docker environment. `.Rprofile` gates the entire `renv` workflow on the environment variable `ZZCOLLAB_CONTAINER=true`, which is only set inside the Docker container. On a bare host runner the variable is absent, so `.Rprofile` prints ‘Host R session (`renv` skipped – use container for reproducibility)’ and exits the `renv` block entirely. Any workflow step that subsequently calls `renv::restore()` finds no active project library and fails with a cascade of ‘dependency failed’ errors covering every package in the lockfile.

The host-runner approach sidesteps this entirely: `r-lib/actions/setup-r-dependencies@v2` reads declared dependencies from `DESCRIPTION` and installs the latest compatible versions from Posit

Package Manager, without invoking `renv` at all. This is semantically correct because `R CMD check` is agnostic to `renv`; it only requires that `DESCRIPTION`-declared packages are present on `.libPaths()`.

The tradeoff is that the workflow tests against the latest compatible package versions, not the pinned versions in `renv.lock`. For a package validity check this is the right behaviour. A package whose `R CMD check` passes only against a specific pinned version has undeclared version constraints that belong in `DESCRIPTION`.

Key decisions in `r-package.yml`

`setup-r-dependencies@v2` not `setup-renv@v2`: The correct action for a `DESCRIPTION`-driven install is `r-lib/actions/setup-r-dependencies`. Using `r-lib/actions/setup-renv` calls `renv::restore()`, which fails on `zzcollab` repos because `.Rprofile` suppresses `renv` outside the container. Note also that the action name `r-lib/actions/install-r-package-deps` does not exist; the correct name is `setup-r-dependencies`.

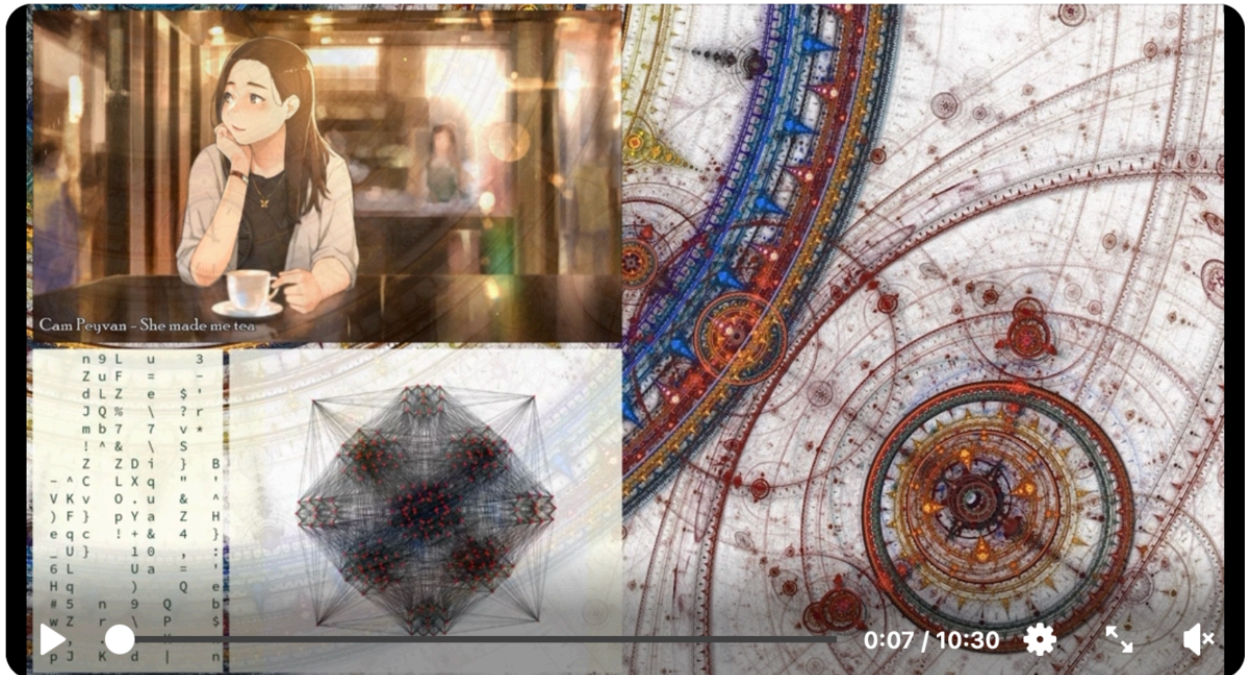
`extra-packages: any::rcmdcheck` with `needs: check`: `rcmdcheck` is a CI tool, not a project dependency. It does not appear in `DESCRIPTION` and must be declared explicitly so `setup-r-dependencies` installs it alongside the project packages. The `needs: check` tag is the standard convention signalling that this is a check workflow.

`r-lib/actions/check-r-package@v2`: This action wraps `rcmdcheck::rcmdcheck()` with sensible defaults and uploads check artefacts. It fails the workflow on any `ERROR` and treats `WARNING`s as errors by default. Undocumented exported objects produce a `WARNING` and will therefore fail CI; all exported functions must have `roxygen2` documentation entries.

`use-public-rspm: true`: Tells `setup-r` to configure Posit Package Manager as the package repository, providing pre-compiled Linux binaries and avoiding source compilation for most packages.

No `renv`, no container pin: The workflow installs the latest compatible versions of declared dependencies. This is intentional. If a package requires a specific minimum version, express that constraint in `DESCRIPTION` with a `(>= x.y.z)` qualifier.

[Cinnamon] Soft mood and latex workflow



The Report-Rendering Workflow: `render-report.yml`

Place this file at `.github/workflows/render-report.yml`. It applies only to manuscript-package repos that contain `analysis/**/report.Rmd` files.

```
name: Render Reports

on:
  push:
    branches: [main, master]
    paths:
      # WHY path filters: building the Docker image takes 5-15 minutes.
      # Triggering only when analysis code, R source, the lockfile, or the
      # Dockerfile changes avoids that cost on documentation-only pushes.
      - 'analysis/**'
      - 'R/**'
      - 'renv.lock'
      - 'Dockerfile'
      - '.github/workflows/render-report.yml'
  pull_request:
    branches: [main, master]
    paths:
```

- 'analysis/**'
- 'R/**'
- 'renv.lock'
- 'Dockerfile'

jobs:

render:

runs-on: ubuntu-latest

The job runs on a bare host runner, but all R work happens inside
the project's own Docker container (see 'docker run' step below).

steps:

- uses: actions/checkout@v6
Makes the repo contents available at \$GITHUB_WORKSPACE, which is
then bind-mounted into the container.
- uses: docker/setup-buildx-action@v3
Initialises BuildKit, the modern Docker build backend. Required
for --mount=type=cache in the Dockerfile (layer caching syntax).
- name: Build Docker image
run: |
docker build -t compendium-env .
Builds the project's own Dockerfile, not a generic rocker image.
This means the render runs against the exact pinned environment
defined in this repo, including all tlmgr-installed LaTeX packages.
- name: Restore packages and render all manuscripts
run: |
docker run --rm \
--rm: remove the container after it exits (no orphan containers)
-e CI=true \
CI=true: signals to R packages (e.g. usethis, renv) that this
is a non-interactive CI run; suppresses prompts and progress bars.
-v \${{ github.workspace }}:/project \
Bind-mounts the checked-out repo into the container at /project,
so the container can read source files and write rendered output
back to the runner's workspace for the upload step.
-w /project compendium-env \
Sets the container working directory to /project (the repo root).
Rscript -e '
renv::restore()
Synchronises the container library with renv.lock. The
Dockerfile already ran renv::restore() at build time, so this
is typically a no-op -- but it catches any drift introduced by
bind-mounting the host repo over the container filesystem.
rmds <- list.files(

```

"analysis", pattern = "^report[.]Rmd$",
recursive = TRUE, full.names = TRUE
)
cat("Found", length(rmds), "manuscripts\n\n")
failed <- character()
for (rmd in rmds) {
  cat("=== Rendering:", rmd, "===\n")
  old_wd <- setwd(dirname(rmd))
  tryCatch(
    rmarkdown::render(basename(rmd)),
    error = function(e) {
      cat("FAILED:", conditionMessage(e), "\n")
      failed <- c(failed, rmd)
      # Collect failures rather than stopping at the first one,
      # so all manuscripts are attempted and all errors reported.
    }
  )
  setwd(old_wd)
}
cat("\n=== summary ===\n")
cat("rendered:", length(rmds) - length(failed), "\n")
cat("failed: ", length(failed), "\n")
if (length(failed) > 0) {
  for (f in failed) cat(" ", f, "\n")
  quit(status = 1)
  # Exit non-zero so the GitHub Actions step is marked failed.
}

```

- name: Upload rendered PDFs

if: always()

WHY always(): uploads artefacts even when the render step failed,
so partially-rendered PDFs are available for debugging.

uses: actions/upload-artifact@v4

with:

name: rendered-manuscripts

path: |

analysis/**/*pdf

retention-days: 30

if-no-files-found: warn

warn rather than error: a repo with no report.Rmd files yet is
not a failure; the step completes with a warning instead.

Key decisions in render-report.yml

Path filters: The workflow triggers only when files under `analysis/`, `R/`, `renv.lock`, or the Dockerfile change. This avoids running a full Docker build on every push that touches only documentation or CI configuration.

Docker build inside CI: The workflow builds the project's own Docker image rather than using `rocker/verse` directly. This means the rendered output reflects the exact environment defined in the repo's Dockerfile, including any custom system dependencies.

if-no-files-found: warn: If the repo contains no `report.Rmd` files, the upload step warns rather than fails. This makes the workflow safe to include in repos where manuscripts are work-in-progress.

No r-package.yml duplication: `render-report.yml` does not run R CMD check. It is the companion to `r-package.yml`, not a replacement; a manuscript-package repo requires both.

Verification

After placing the correct workflow files, push a commit to `main` and confirm CI passes:

```
gh run list --repo <owner>/<repo> --limit 3
gh run view <run-id> --log-failed
```

A successful `r-package.yml` run ends with:

```
Status: 0 ERRORS, 0 WARNINGS, N NOTES
```

A successful `render-report.yml` run uploads one PDF per `report.Rmd` found in the `analysis/` tree.

Diagnosing common failures

'Packages required but not available': `RENV_CONFIG_REPOS_OVERRIDE` is missing or wrong. Check that the URL ends in `noble/latest` (not `jammy/latest`) for Ubuntu 24.04 containers.

'Could not detect profile from Dockerfile': The Dockerfile is missing `# Profile: <name>` in the first 20 lines. Add it before running `make r` or pushing to CI.

'no package called here' in tinytest: A test file calls `library(here)` but `here` is not declared in `DESCRIPTION`. Add `here` to `Suggests`.

'Namespaces in Imports field not imported from': A package is listed in `DESCRIPTION Imports` but never used. Remove it or demote it to `Suggests`.

Daily Workflow

With both workflow files in place, the typical development loop is:

Action	CI triggered
git push to main	both workflows if paths match
Edit analysis/ only	render-report.yml only
Edit R/ only	both workflows
Edit .github/ only	neither (path filters exclude it)

Running `zcc doctor` before pushing catches most structural issues (missing `# Profile:`, outdated `.Rprofile`, misplaced files) before they become CI failures.

Things to Watch Out For

1. **The `zzcollab` `.Rprofile` suppresses `renv` on any host runner.** `.Rprofile` gates `renv` activation on `ZZCOLLAB_CONTAINER=true`. This variable is only set inside the Docker container. Any CI workflow that runs on a bare Ubuntu runner and calls `renv::restore()` (including `r-lib/actions/setup-renv@v2`) will silently skip `renv` activation and then fail with ‘dependency failed’ errors for every package in the lockfile. The fix is to use `setup-r-dependencies@v2` in `r-package.yml` (which reads from `DESCRIPTION`, not `renv.lock`) and to reserve `renv`-based workflows for `render-report.yml`, which runs inside the container where `ZZCOLLAB_CONTAINER=true` is present.
2. **`renv::status()$synchronized` is not a stable API field.** `renv::status()` returns a list but the `$synchronized` element is internal to `renv` and has changed across versions. CI templates that check `isTRUE(status$synchronized)` to gate a quit will misfire: `renv` may report drift for reasons unrelated to the lockfile (for example, because `renv` itself was downgraded from 1.2.3 to 1.2.2 during `restore`, which is lockfile-consistent but triggers a status change). The symptom is a ‘`renv lockfile is not synchronised`’ failure immediately after a successful `renv::restore()`. Remove this check from `render-report.yml` entirely; `renv::restore()` already exits non-zero on genuine failures.
3. **`r-lib/actions/install-r-package-deps` does not exist.** The correct action name is `r-lib/actions/setup-r-dependencies`. Using the wrong name produces ‘Can’t find action.yml’ and a silent job failure with no informative error message.
4. **Both workflows trigger on the same push if both are present.** In a manuscript-package repo this is correct. In a data-analysis repo with no manuscripts, `render-report.yml` will still run but will find zero `report.Rmd` files and exit with a warning, not an error.
5. **Undeclared exported objects fail CI.** `check-r-package@v2` treats `WARNINGS` as errors. Every object exported via `@export` in `roxygen2` must have a documentation entry. Constants and datasets exported via `NAMESPACE` also require documentation. The check message is ‘Undocumented code objects’; the fix is to add a minimal `roxygen2` block to each object.

6. **Undeclared test dependencies also fail CI.** If a test file calls `library(foo)` or `foo::bar()` and `foo` is not listed in `DESCRIPTION` under `Imports` or `Suggests`, R CMD check fails even if `foo` is in `renv.lock`. `renv.lock` is invisible to R CMD check.
7. **render-report.yml builds the Docker image on every triggered run.** Without a Docker layer cache, this adds 3-10 minutes per run. The workflow does not currently use `cache-from` or `cache-to` for the Docker build step.
8. **TinyTeX auto-install does not work in CI.** `rocker/verse` ships a system-level TeX Live installation, not TinyTeX. TinyTeX's auto-install mechanism requires the wrapper scripts placed by `tinytex::install_tinytex()`; `rocker/verse` provides plain TeX Live executables instead, so no wrappers are present. When `xelatex` encounters a missing package such as `amssymb.sty` or `booktabs.sty`, it fails immediately with 'File not found'. Pre-install every required LaTeX package via `tinytex::tlmgr_install()` in the Dockerfile; the image must be self-contained.
9. **Packages installed by the Dockerfile outside renv.lock are invisible after renv::restore().** Packages written to the site library by `install.packages()` during the Docker build are not recorded in `renv.lock`. When `render-report.yml` calls `renv::restore()`, `renv` activates a project library that shadows the site library, making those packages invisible. The symptom is 'there is no package called X' immediately after a successful restore. The fix is to run `renv::snapshot()` inside the container after any `install.packages()` call that adds a render-time dependency.

Uninstall / Rollback

To remove CI from a repo:

```
rm .github/workflows/r-package.yml
rm .github/workflows/render-report.yml
git add -u .github/workflows/
git commit -m "Remove CI workflows"
git push
```

GitHub Actions stops triggering automatically once the YAML files are removed. Any in-progress runs will complete before the removal takes effect.



What Did We Learn?

Lessons Learnt

Conceptual understanding:

- Workspace type (manuscript-package, data-analysis, blog-post) determines the correct CI combination. Applying the same workflow to all repos masks real differences in what each repo needs to verify.
- `r-package.yml` and `render-report.yml` answer different questions and must use different execution environments. `r-package.yml` runs on a bare host runner and reads from `DESCRIPTION`; `render-report.yml` runs inside the project container and reads from `renv.lock`. Conflating the two produces failures that are difficult to diagnose.
- The `zzcollab .Rprofile` is a first-class architectural constraint, not an implementation detail. Any CI workflow that touches `renv` on a host runner will fail silently because `.Rprofile` gates `renv` on `ZZCOLLAB_CONTAINER=true`. Understanding this gate is prerequisite to writing any new `zzcollab` CI template.
- Internal `renv` API fields (such as `renv::status()$synchronized`) are not stable across `renv` versions and should not be used as CI gates. Use `renv::restore()` exit codes instead.

Technical skills:

- `gh run list --json workflowName,conclusion,createdAt --jq` produces a concise pass/fail table across multiple repos without opening the browser.
- `gh run view --log-failed` isolates the failing step and its error message without scrolling through the full log.
- Comparing workflow file line counts across commits (`git show SHA:path | wc -l`) quickly confirms whether a file changed between two runs.
- `diff <(git show SHA1:file) <(git show SHA2:file)` is more reliable than `git diff SHA1..SHA2 -- file` when working from a Dropbox-synced path, where the path-filtered diff may return empty output unexpectedly.
- `zzc validate --fix` scans R source files and adds missing packages to `DESCRIPTION` and stub entries to `renv.lock`. The stub entries lack `Hash` and `Requirements` fields; a full `renv::snapshot()` inside the container is still required to produce a complete lockfile.

Gotchas and pitfalls:

- A cascade of ‘dependency failed’ errors in `setup-renv@v2` on a host runner is almost always caused by `.Rprofile` suppressing `renv`, not by missing packages. Check for the message ‘Host R session (renv skipped)’ in the step log before investigating individual packages.
- `actions/checkout@v6` exists and is current as of May 2026. Checking the GitHub Marketplace release history before assuming a version is wrong prevents unnecessary edits.
- `r-lib/actions/install-r-package-deps` is not a real action. The correct name is `r-lib/actions/setup-r-dependencies`. The error message (‘Can’t find action.yml’) is not informative about the cause.
- Adding `render-report.yml` to a data-analysis repo is harmless but wasteful. The `if-no-files-found: warn` option prevents a hard failure, but the Docker build step still runs on every triggered push.

- ‘there is no package called X’ immediately after a successful `renv::restore()` means X was installed by the Dockerfile outside `renv.lock` and is being shadowed by the `renv` project library. Run `renv::snapshot()` inside the container to record it.
- Missing LaTeX packages (`amssymb.sty`, `booktabs.sty`, etc.) in CI always indicate a gap in the Dockerfile’s `tlmgr_install()` list. TinyTeX auto-install is absent in `rocker/verse`; do not wait for it.

Limitations

- These two workflow files cover only the most common `ztc` CI patterns. Repos with Shiny applications, pkgdown sites, or Quarto books require additional or different workflow files not documented here.
- `r-package.yml` tests against the latest compatible package versions, not the pinned versions in `renv.lock`. A regression introduced by a new upstream package release will appear in `r-package.yml` CI but not in local development (which uses pinned versions). This is a feature, not a defect, but it requires prompt attention when CI fails on a push that made no package-related changes.
- `render-report.yml` does not cache the Docker build. Large images with many compiled system libraries can take 10 or more minutes to build from scratch on every triggered run.
- The `ztcollab` `.Rprofile` design (`renv` gated on `ZZCOLLAB_CONTAINER=true`) means any future CI workflow that needs `renv` on a host runner must either run inside the container or set the variable explicitly, which is semantically misleading. A cleaner long-term fix would gate `renv` on `CI=true || ZZCOLLAB_CONTAINER=true`, but this requires a coordinated change to the `ztcollab` `.Rprofile` template.
- The workflows target the `main` and `master` branches only. Feature branches do not get CI unless the `on: push: branches` list is extended.
- Neither workflow addresses code coverage, linting, or spell-checking. These require additional workflow steps or separate YAML files.

Opportunities for Improvement

1. Add Docker layer caching to `render-report.yml` using `cache-from: type=gha` and `cache-to: type=gha,mode=max` in the build step to reduce build times from 10 minutes to under 2 minutes on cache hits.
2. Extend `ztc doctor` to scaffold `render-report.yml` automatically for manuscript-package repos, so the file is present from first `ztc init` rather than requiring manual distribution.
3. Add a `--no-vignettes` flag to the `rcmdcheck::rcmdcheck()` call for repos with vignettes that require LaTeX, which is not available on the bare host runner used by `r-package.yml`.
4. Parameterise the R version and Ubuntu codename in both workflow files so that bumping the container image requires a change in one place rather than two.
5. Add a workflow dispatch trigger (`on: workflow_dispatch`) to both files so CI can be triggered manually from the GitHub Actions tab without a push.
6. Build a `ztc ci-status` subcommand that queries `gh run list` for all repos in a directory tree and reports pass/fail in a single table.

Wrapping Up

Getting CI right in a zccollab portfolio is a two-step problem: first, identify the workspace type; second, apply the correct workflow combination. The manuscript-package type is the most common and the most demanding, requiring both `r-package.yml` and `render-report.yml`. The data-analysis type needs only the package check. The blog-post type needs neither.

The most important architectural insight from developing these workflows is that the two files must use different execution environments because they answer different questions. `r-package.yml` asks whether the package is structurally sound, reads from `DESCRIPTION`, and runs on a bare host runner. `render-report.yml` asks whether the fully pinned containerised environment produces a rendered output, reads from `renv.lock`, and runs inside the project's own Docker image. Conflating the two – for example, by running `renv::restore()` on a host runner – triggers the zccollab `.Rprofile` gate and produces a cascade of ‘dependency failed’ errors that obscure the real cause.

The practical corollary is that `r-package.yml` must use `r-lib/actions/setup-r-dependencies@v2` (reading from `DESCRIPTION`), not any `renv`-based action, precisely because the zccollab `.Rprofile` gate makes `renv` silent on host runners. Equally, `render-report.yml` should not gate on `renv::status()$synchronized`: that field is an internal `renv` API that misfires after a version downgrade, and `renv::restore()` exit codes are the correct signal. For diagnostics, `zcc doctor` before a push and `gh run view --log-failed` after one cover most failure modes without opening the browser.

See Also

Related posts:

- [A tiered CI strategy for zccollab research compendia](#): companion post on the broader CI philosophy behind these workflow files.

Key resources:

- [GitHub Actions documentation](#): reference for workflow syntax, triggers, and runner environments.
- [Posit Package Manager](#): source of pre-compiled R package binaries for Linux distributions.
- [rocker-org/rocker-versioned2](#): source for the `rocker/tidyverse` and `rocker/verse` container images used in CI.
- [renv documentation](#): reference for `renv.lock`, `RENV_CONFIG_REPOS_OVERRIDE`, and related configuration options.

Glossary

The following terms appear throughout this post. Readers familiar with GitHub Actions can skip this section.

Workflow: a YAML file placed under `.github/workflows/` that defines one or more automated jobs. GitHub executes the workflow whenever a configured trigger event occurs.

Trigger (on): the event that causes a workflow to run. Common triggers are `push` (a commit pushed to a branch), `pull_request` (a PR opened or updated against a branch), and `workflow_dispatch` (a manual run initiated from the GitHub Actions tab).

paths: filter: narrows a `push` or `pull_request` trigger to fire only when at least one changed file matches the listed glob patterns. Used in `render-report.yml` to avoid a full Docker build on documentation-only pushes.

branches: filter: further narrows a trigger to specific branch names. Both workflows target `main` and `master` only; pushes to feature branches do not trigger CI unless this list is extended.

Job: a named set of steps that execute sequentially on the same runner. Each workflow in this post defines one job (`check` and `render`, respectively).

Runner: the virtual machine that executes a job. `runs-on: ubuntu-latest` requests a GitHub-hosted Ubuntu 24.04 runner. Runners are ephemeral: they are provisioned fresh for each job run and discarded afterwards.

Step: one unit of work within a job. A step is either a `run:` block (arbitrary shell commands) or a `uses:` block (a pre-built action). Steps within a job share the same runner filesystem and environment variables.

Action (uses:): a reusable automation unit published to the GitHub Marketplace or a repository. Referenced as `owner/repo@version`, for example `actions/checkout@v6`. The version tag pins the action to a specific major release; updates within that major version are pulled automatically.

with:: named input parameters passed to an action. The available inputs are defined by the action's own `action.yml`; passing an unrecognised key is silently ignored.

env:: key-value pairs that are injected as environment variables for the scope in which they are declared (workflow, job, or individual step). Variables declared at job level are visible to all steps in that job.

Secret (secrets.*): an encrypted value stored in the repository's Settings > Secrets. Accessed in a workflow via the expression syntax `${{ secrets.NAME }}`. `GITHUB_TOKEN` is auto-provisioned by GitHub Actions for every run and requires no manual setup.

Expression (\${{ ... }}): GitHub Actions' interpolation syntax, evaluated at workflow parse time. Common uses include accessing secrets (`${{ secrets.GITHUB_TOKEN }}`), context variables (`${{ github.workspace }}`), and conditional expressions in `if:` fields.

Artifact: a file or directory uploaded from a workflow run via `actions/upload-artifact`. Artifacts are retained for the number of days specified by `retention-days` and can be downloaded from the run summary page. Used in `render-report.yml` to preserve rendered PDFs.

if: always(): a step-level condition that evaluates to true regardless of whether previous steps succeeded or failed. Used on the upload step so that partially-rendered PDFs are available for debugging even when a render fails.

r-lib/actions: a collection of GitHub Actions maintained by the r-lib organisation specifically for R workflows. The three used in this post are `setup-r` (installs R), `setup-r-dependencies` (installs packages from DESCRIPTION), and `check-r-package` (runs R CMD check via `rcmdcheck`).

workflow_dispatch: an on-demand trigger that enables a workflow to be run manually from the GitHub Actions tab without pushing a commit. Not currently configured in these workflows; see Opportunities for Improvement.

Reproducibility

Tested configuration:

Component	Version
Operating system (host)	macOS 15.4
Operating system (CI)	Ubuntu 24.04.4 LTS (noble)
R (host runner)	latest release (setup-r)
rocker/verse (render-report)	4.6.0
actions/checkout	v6
r-lib/actions/setup-r	v2
r-lib/actions/setup-r-dependencies	v2
r-lib/actions/check-r-package	v2
actions/upload-artifact	v4
docker/setup-buildx-action	v3
Last verified	2026-05-22

Workflow files (genericised):

- `docs/r-package.yml`: annotated generic R CMD check workflow
- `docs/render-report.yml`: annotated generic report-rendering workflow

Rendered on 2026-05-22 at 18:16 PDT. Source: `~/prj/qblog/posts/69-zzc-github-workflows/zzc-github-workflows/analysis/report/index.qmd`

Let's Connect

Have questions, suggestions, or spot an error? Let me know.

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Related posts in this cluster

This post is part of the *ZZCOLLAB Reproducible Compendia* series. Recommended reading order:

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3. Post 03: [From Markdown to Blog Post: A ZZCOLLAB workflow](#)
4. Post 04: [Sharing R Code via Docker: R Markdown Reports](#)
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8. **Post 08: GitHub Actions workflows for zzcollab research compendia** (this post)